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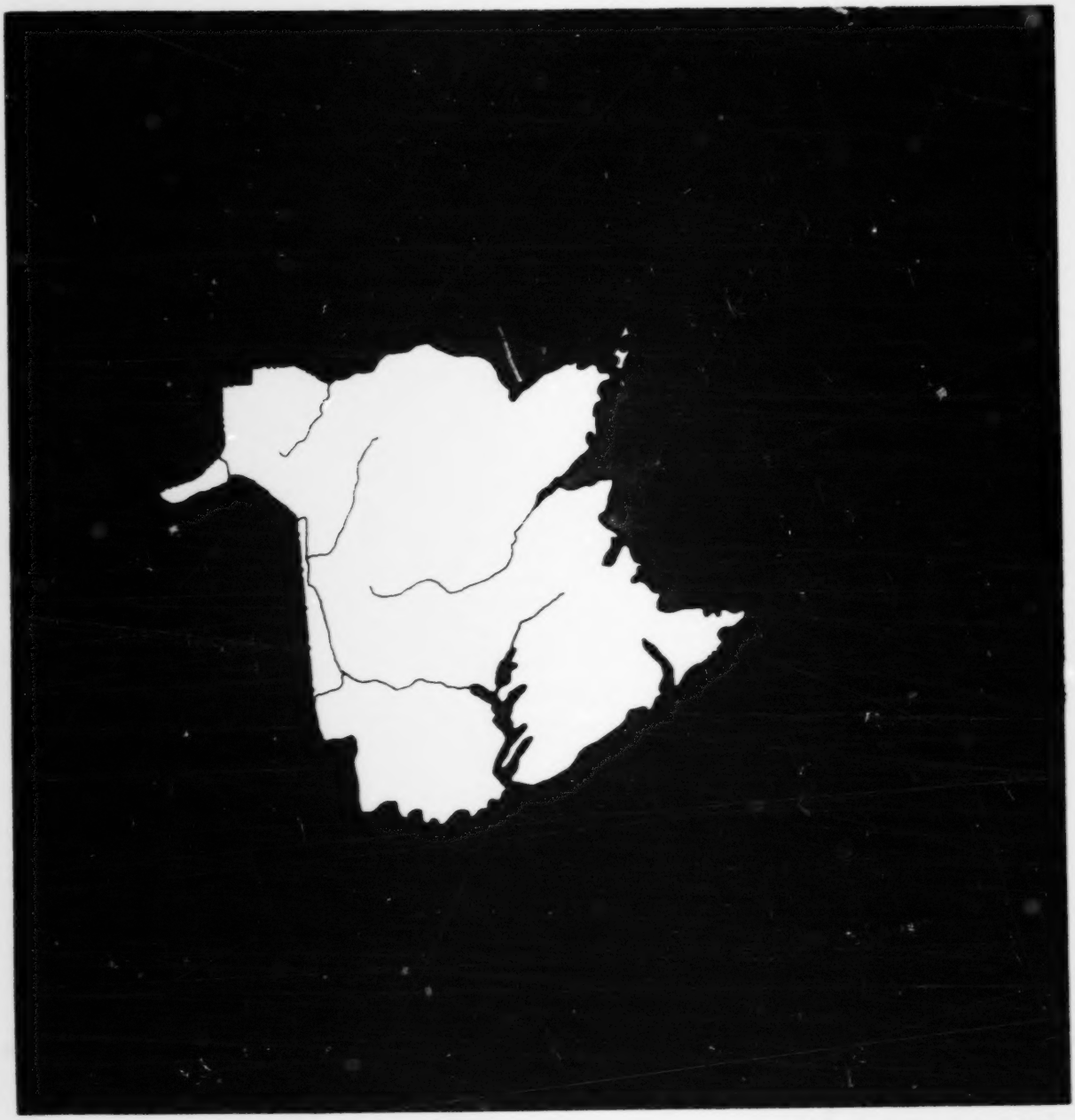
SOILS OF THE ROGERSVILLE–RICHIBUCTO REGION OF NEW BRUNSWICK



Canada

Ninth Report of the
New Brunswick Soil Survey

SOILS OF THE ROGERSVILLE–RICHIBUCTO REGION OF NEW BRUNSWICK

C. Wang
Land Resource Research Institute
Ottawa, Ontario

H. W. Rees
Land Resource Research Institute
Ottawa, Ontario
(Formerly with New Brunswick
Department of Agriculture and
Rural Development)

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SUMMARY

This soil survey report of the Rogersville–Richibucto region covers an area of about 405 000 ha located in the eastern central portion of New Brunswick. The survey area is bordered by the Miramichi River in the north, south to latitude 46°30′, west to longitude 65°45′, and east to Northumberland Strait.

The climate of the area is relatively uniform. Mean annual temperature is about 4.5°C and annual precipitation is about 1050 mm (about one-third is snow). Average degree-days above 5°C are 1400–1525, average growing season is 170–185 days, and average number of frost-free days, 120–140. Mean annual soil temperature is about 5–8°C.

Two main forces have shaped the landscape of the region: the Wisconsin Glaciation and the postglacial marine or fluvial deposition or both. Along the east coast, where the landform is usually flat to undulating, the dominant soils are sandy podzols and organic soils (bogs). The sandy podzols are developed in shallow acidic marine-modified outwash material underlain by soft Pennsylvanian sandstone, the organic soils are about 5 m deep and are mostly undecomposed sphagnum moss. There is a distinct lacustrine basin in the north bordered by the Miramichi River. Soils are mostly fine-textured and poorly drained and are classified as Gleysols; the parent materials of these soils are usually neutral in reaction and relatively rich in natural fertility. The rest of the region (most of the survey area) is covered by thin (usually less than 2 m) ground moraines; most of them are fine loamy, but some are coarse loamy. The till is usually very compact and acid, and the subsoils of most of this region are impermeable to water and roots. Landforms are undulating to slightly rolling. The dominant soils of this till area are classified as Podzolic Luvisols. Many also have weakly developed fragipan.

Interpretation guide sheets were made for individual soil units of each mineral association. Interpretation sheets include

- limitations for farmland, community development, and recreation uses
- degree of limitations affecting woodland uses
- suitability of soil as source of material
- soil features affecting specified engineering uses.

The criteria used to determine and rank the limitations and the method used to rate the suitability of soil as source of material are discussed in detail.

INTRODUCTION

In response to the increasing demand for soil information to accommodate the development of this region and for more accurately assessing the agricultural potential of this area, a soil survey project (scale 1:50 000) for the Rogersville–Richibucto region was initiated jointly by the New Brunswick Soil Survey Committee and the Land Resource Research Institute, Ottawa, in the spring of 1973. This project was financially supported by Agriculture Canada and the New Brunswick Department of Agriculture and Rural Development.

The Rogersville–Richibucto region is located in eastern central New Brunswick: south to latitude 46°30′, west to longitude 65°45′, east to Northumberland Strait, and north bordering the Miramichi River. It includes the northern half of Kent County and the southeastern portion of Northumberland County.

The survey fieldwork was started in the summer of 1973 and completed by November 1976. Soil correlation and spot checking were carried out during the field seasons of 1977 and 1978.

This report is divided into five chapters. Chapter one is the general description of the area. It contains information concerning the soil environment in general, such as location, geology, landscape, parent material, vegetation, and climate.

Chapter two deals with soil formation, classification, and surveying methods and procedures. It includes maps of soil description sites, soil sampling sites, and road accessibility. This chapter explains the accuracy of this soil map.

Chapter three deals with mapping units and soil associations. It includes the soil map legend, general characteristics of each soil association, and block diagrams of parts of the landscape, which show soil distributions.

Chapter four is devoted to land use. Land use interpretations for each mapping unit of each soil association are tabulated. The criteria used for each land use interpretation and the limitations of each mapping unit are described and discussed in detail.

Chapter five contains detailed soil descriptions and chemical, physical, and engineering analytical data.

CHAPTER ONE: GENERAL DESCRIPTION OF THE AREA

Location of the area and its principal towns

The Rogersville–Richibucto soil survey area encompasses about 405 000 ha of land on the east coast of New Brunswick. It is bounded by the Miramichi River and Miramichi Bay on the north, Northumberland Strait on the east, latitude 46°30′ on the south, and longitude 65°45′ on the west. This includes the northern half of Kent County and the southeastern portion of Northumberland County (see Fig. 1).

The principal centers of population within the area are the town of Chatham (pop. 7635) and the villages of Buctouche (2614), Loggieville (905), Nelson-Miramichi (1590), Rexton (858), Richibucto (2032), Rogersville (1214), and Saint-Louis-de-Kent (1262). Of these, all but Rogersville are located close to waterways, reflecting the dependence of early settlements on oceans and rivers for a livelihood (the fishing industry) as well as for transportation. Even today fishing is the primary industry of most of the smaller coastal communities, with forestry, agriculture, recreation, and tourism playing lesser roles. Chatham, on the mouth of the Miramichi River, is the largest town in the area. As well as being more industrialized than other towns it also is the site of an airbase. It has docking facilities for ocean-going vessels, but Newcastle, which is about 8 km away and just outside the survey area, is the center of shipping activity. Rogersville, the principal inland village, is dependent on a combination of agriculture and forestry, and is probably best known as a center for the production of brussels sprouts.

Also of interest is the Kouchibouguac National Park, which occupies about 22 000 ha of coastline from just north of Saint-Louis-de-Kent to just south of Point Sapin. The objective of the park is to preserve the natural flora and fauna of the coastal environment for public display. This aspect, coupled with a high-quality beach, is rapidly making Kouchibouguac National Park the major tourist attraction in the area.

Geology

The bedrock geology is simple. In almost the whole survey area, thin deposits of unconsolidated material are underlain by horizontally bedded Pennsylvanian sandstones (Fig. 2). There are, however, some minor areas underlain by soft red shale of Pennsylvanian age.

There are two types of Pennsylvanian sandstone, one greenish gray and the other red. The greenish gray sandstone is dominant: the sand grains are mostly medium and fine size; petrographically it has about 60–85% quartz, 10–30% feldspars, 5–10% biotite and muscovite, and minor amounts of chlorite; it is noncalcareous. The red sandstone occurs much less often: it is found mostly along the coast, particularly on the eroded coastal plain; it is only obvious where the overlying greenish gray sandstone has been eroded; the sand grains of the red sandstone are somewhat finer than those in the greenish gray type; detailed data are not available on its petrographic components, but it contains less quartz and more mica and iron-rich minerals such as hornblende, magnetite, and hematite; it is noncalcareous, but softer than the greenish gray sandstone.

The soft red shale is found only in small pockets on the southern part of the survey area. It is noncalcareous and usually contains more than 35% clay and less than 10% sand.

Landscape

The two main forces that shaped the landscape of the region are the Wisconsin Glaciation and a marine transgression. Postglacial rivers have made important modifications (Fig. 3).

The entire survey area was at one time covered by Wisconsin glacial drifts. The glacier may have been fairly thin, because with the exception of the glacial fluvial deposits, the glacial drift material (mainly ground moraine) is

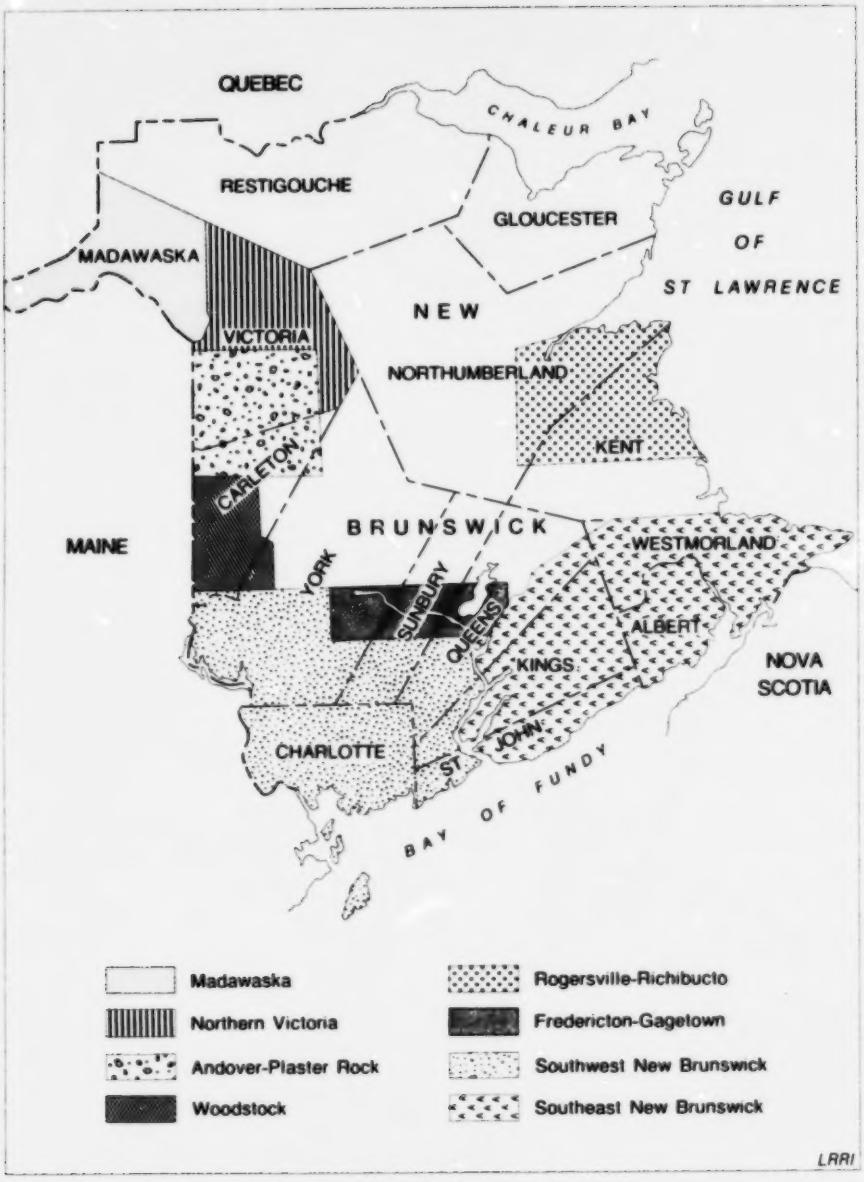


Fig. 1 Areas for which soil survey reports have been published

commonly less than 2 m and occasionally less than 1 m thick.

There are three main geomorphic landscape types: the morainal till plain, the outwash coastal plain, and the smaller areas of lacustrine plain.

Most of the survey area is covered by undulating to gently rolling morainal till plain. Steeper slopes are found only on the banks of rivers or streams. There are only a few kames and eskers that break up the otherwise monotonous till plain landscape.

The outwash coastal plain occupies a strip 15–30 km wide along the coast on the eastern part of the survey area. The topography varies from nearly level to gently undulating, but in some areas, especially where the parent material is marine clay, slopes are steep and the landscape has a hummocky appearance owing to postglacial erosion.

The lacustrine plain is confined mainly to the northern half of the survey area, and is almost exclusively associated with a nearly level landscape. Relatively inconspicuous beach ridges (usually no more than 60 cm high and 10–100 m wide) can often be detected along the rim of isolated portions of the lacustrine plain.

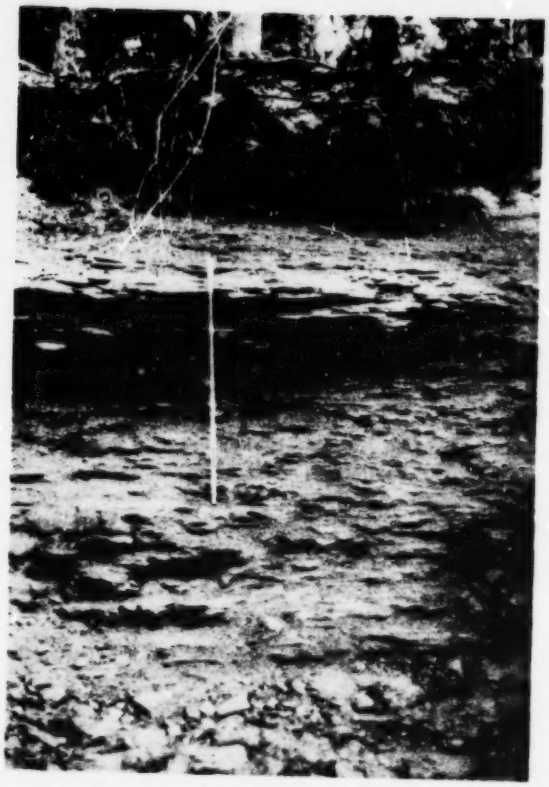


Fig. 2 Typical Pennsylvanian sandstone bedrock

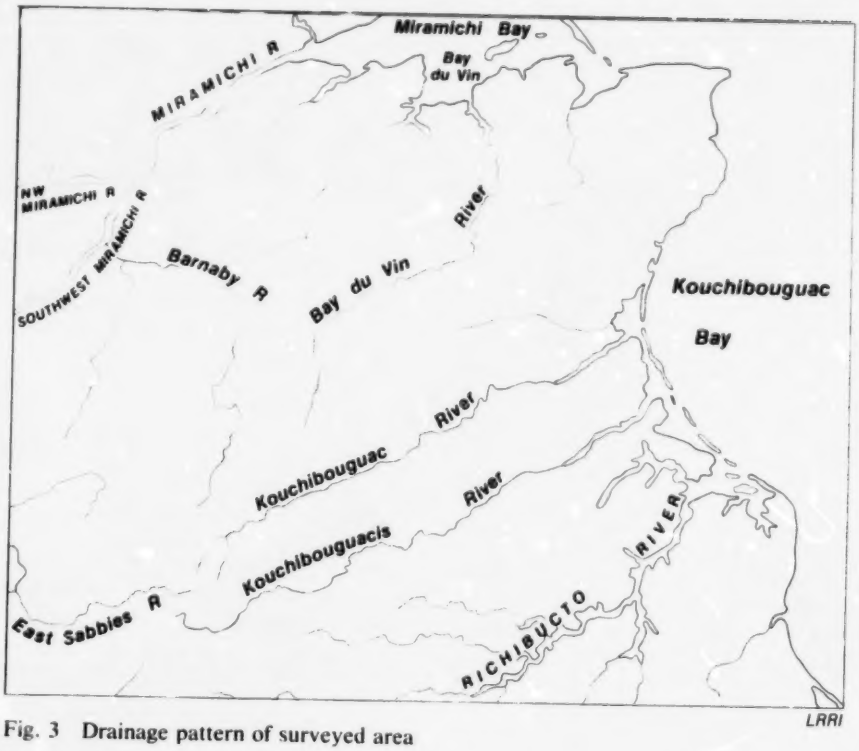


Fig. 3 Drainage pattern of surveyed area

Soil parent material

Glacial till, marine-influenced outwash sand, lacustrine clay, and marine clay are the four major types of mineral soil parent materials. About 5% of the survey area is occupied by organic soils.

Glacial till

Glacial till, the most widespread type of parent material, covers most of the survey area with the exception of the eastern coastal plain and the northern basin (Fig. 4). There are two types of till: dense, compact lodgment tills and less dense, friable ablational tills. The lodgment tills are acid, of fine loamy particle size, and slowly to very slowly permeable. Three types could be distinguished according to lithological composition of the coarse fraction: mostly Pennsylvanian greenish gray sandstone in coarse fragments; mostly a mixture of red shale and Pennsylvanian greenish gray sandstone in coarse fragments; and mostly fragments of nonlocal bedrock such as granite, volcanic, schist, and slate. The ablational till is acid, of coarse loamy particle size, moderately to highly permeable, and dominated by Pennsylvanian greenish gray sandstone coarse fragments.

Marine-influenced outwash sand

This material is most commonly found on the undulating coastal plain. It is acid, loose, and derived from weathered Pennsylvanian sandstone. The lithologic composition is almost the same as that of the underlying sandstone bedrock.

Lacustrine clay

Lacustrine clay occurs on level terrain in the northern basin of the survey area. It ranges from neutral to slightly calcareous and is olive brown, slowly to very slowly permeable, and dense. Although it is high in natural fertility, natural drainage is poor.

Marine clay

This material is found mainly on the coastal plain. It is calcareous, reddish, slowly to very slowly permeable, and dense. The natural fertility is high. Although it is associated mostly with level landforms, it is also found on dissected, hummocky terrain.

Vegetation

In the wooded area, white spruce (*Picea glauca*), black spruce (*Picea mariana*), balsam fir (*Abies balsamea*), and jack pine (*Pinus banksiana*) are the dominant coniferous trees. Grey birch (*Betula populifolia*) and trembling aspen (*Populus tremuloides*) are the dominant deciduous trees mixed with coniferous. Red maple (*Acer rubrum*) and yellow birch (*Betula alleghaniensis*) are found locally on better soils. Eastern white pine (*Pinus strobus*), beech (*Fagus grandifolia*), and eastern hemlock (*Tsuga canadensis*) can be found along the inland border. Because many soils in the surveyed area are shallow to bedrock or dense subsoil or both, windthrow is common, particularly near the shore, where strong winds produce open stands in many places.

Although black spruce is commonly found in poorly drained soils and yellow birch and beech are found only on better drained soils, the correlations of vegetation with soils and landform are poor. Grey birch, trembling aspen, and balsam fir are found on all mineral soils, regardless of drainage and landform. The poor correlations could be attributed to the frequent forest fires that have occurred in the surveyed area. According to Wein and Moore (1977),[1] the surveyed area had an average fire rotation period of only 230 years. By comparison, the fire rotation periods in northern New Brunswick were over 1000 years.

Trembling aspen is commonly the first species to regenerate after a forest fire, but jack pine, grey birch, red maple, and yellow birch are also common. Coniferous trees follow aspen and other broad-leaved trees in the succession. White spruce and balsam fir are found usually on better drained sites, black spruce on poorly drained sites, and eastern white pine and jack pine on sandy sites. Mature stands of these conifers are less common owing to the frequent incidence of forest fires.

Climate

There are three weather stations within the surveyed area: Rexton and Chatham, where data are recorded all year, and Point Escuminac, where data are not recorded during the winter months. The stations at Rexton and Point Escuminac are located on the Eastern Coastal Plain (Fig. 4), and the station at Chatham is in the Northern Basin. There is no weather station on the Till Plains.

Two weather stations, Harcourt (south of Central Till Plain) and Renous (west of Western Till Plain), located just outside the surveyed area, are thought to have a climate similar to the two Till Plains. Their climatic information is summarized in Table 1 together with those of the other three weather stations. As shown in Table 1, the climatic differences among the five weather stations are slight. Precipitation is fairly evenly distributed throughout the year.

Within the surveyed area, the average degree-days above 5°C are 1400–1525; the average growing season is 170–185 days above 5°C; and the average number of frost-free days is 120–140 (Agroclimatic atlas of Canada 1976).[2] The average number of degree-days is usually higher on the inland than on the coastal area, but the average growing season and number of frost-free days are usually longer on the coastal area.

The mean annual soil temperature (MAST) is estimated at 5–8°C. It varies somewhat, depending on site characteristics such as moisture, texture, vegetation, and soil color. Generally, the MAST is lower in fine-textured poorly drained soil and higher in coarse-textured well-drained soil; the MAST is also lower in the woods than on cultivated land; and soils with a darker surface have a higher MAST than soils with a lighter surface.

[1]Wein, R. W.; Moore, J. M. Fire history and rotation in New Brunswick. Can. J. For. Res. V(7):285-294; 1977.

[2]Agroclimatic atlas of Canada. Ottawa, Ont.: Research Branch, Agriculture Canada; 1976: 10 maps.

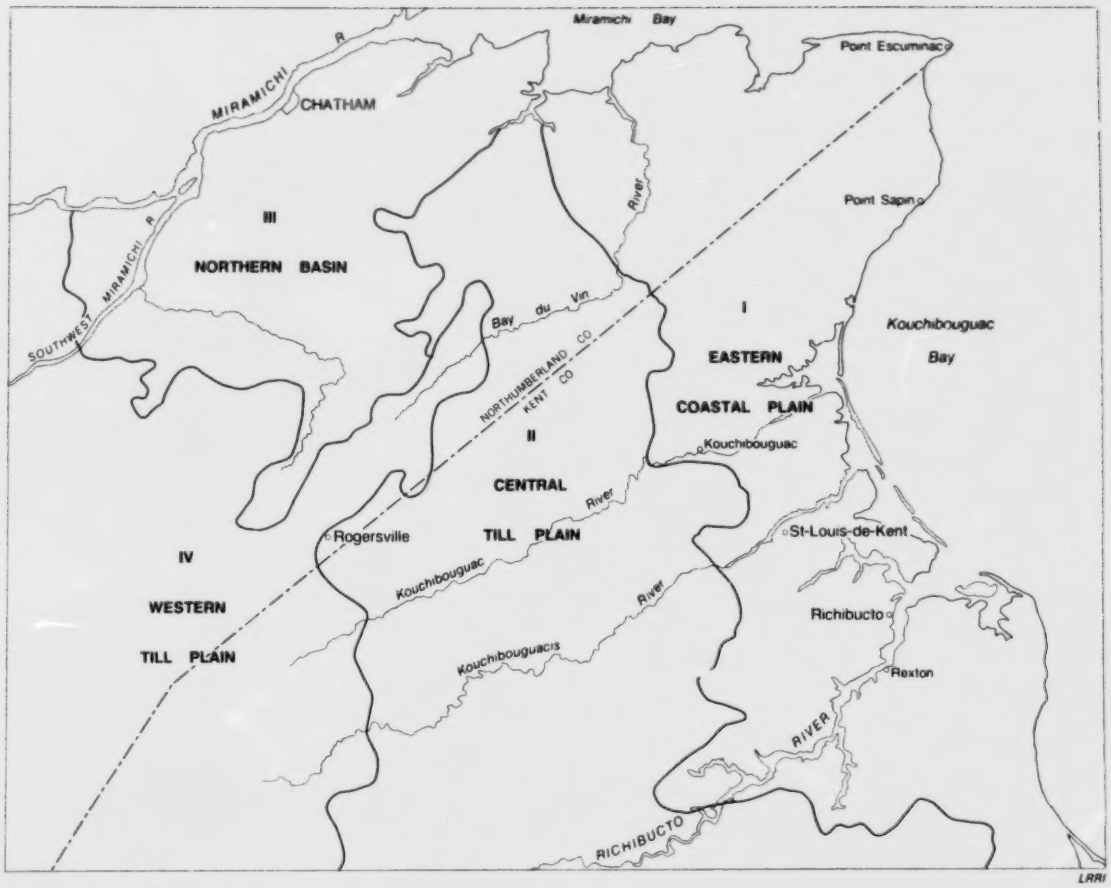


Fig. 4 Soil zones of the surveyed area

Table 1. Mean monthly temperature,[1] precipitation, and snowfall for five long-term weather stations in or near the survey area

Month	Point Escuminac (8 m AMSL)			Rexton (3 m AMSL)			Chatham (34 m AMSL)			Harcourt (46 m AMSL)			Ronous (46 m AMSL)		
	Mean temp. °C	Mean total precip. mm	Mean snow-fall cm	Mean temp. °C	Mean total precip. mm	Mean snow-fall cm	Mean temp. °C	Mean total precip. mm	Mean snow-fall cm	Mean temp.[2] °C	Mean total precip. mm	Mean snow-fall cm	Mean temp. °C	Mean total precip. mm	Mean snow-fall cm
J	–[3]	–	–	−9.1	83.3	45.5	−9.3	97.0	68.1	−9.9	111.3	76.5	−9.7	93.7	57.2
F	–	–	–	−9.1	80.0	45.0	−8.7	90.7	70.6	−9.7	89.2	71.4	−9.8	98.6	60.7
M	–	–	–	−4.1	78.5	31.0	−3.4	83.8	54.9	−4.2	86.1	64.0	−4.0	71.1	42.2
A	–	71.4	20.6	2.4	72.9	11.9	2.9	75.7	28.4	2.9	86.6	37.8	3.0	56.1	15.5
M	–	94.5	1.0	9.1	78.7	1.0	9.5	80.3	2.8	9.2	58.9	1.5	9.4	71.6	1.5
J	–	86.1	0	14.7	83.8	0	15.4	83.6	0	14.6	77.5	0	15.6	83.1	0
J	–	71.1	0	19.1	76.7	0	19.2	75.7	0	17.9	85.9	0	18.8	84.4	0
A	–	85.3	0	17.9	71.1	0	18.0	83.6	0	16.7	89.7	0	16.9	89.2	0
S	–	82.0	0	13.3	78.0	0	13.4	87.1	0	12.2	71.6	0	12.5	88.1	0
O	–	86.9	0.5	7.9	82.8	0.8	7.5	88.4	2.8	6.6	97.8	0.8	6.9	93.5	1.5
N	–	126.2	11.2	1.9	110.7	13.5	1.3	112.3	23.0	0.7	151.1	25.9	0.8	115.8	19.6
D	–	–	–	−6.1	82.6	35.6	−6.6	93.0	57.4	−7.5	81.0	51.1	−7.0	103.1	54.6
Year	–	–	–	4.8	979.1	184.3	4.9	1050.7	308.0	4.1	1086.7	329.0	4.4	1048.3	252.8

[1]Mean monthly temperatures are the monthly average of the daily maximum and daily minimum temperatures at 1.22 m above the ground (Environment Canada Temperature and precipitation summary 1941–70, Atlantic Provinces).
[2]Temperature values available for 1957–65 only.
[3]– No data available.

CHAPTER TWO: SOIL FORMATION AND SURVEYING METHOD

Soil formation and classification

Soil is defined as "...the naturally occurring, unconsolidated mineral or organic material at least 10 cm thick that occurs at the earth's surface and is capable of supporting plant growth" (Canada Soil Survey Committee 1978).[3]

Soil is a dynamic natural body that continuously develops and differentiates itself. Climate, vegetation, topography, parent material, and time are the five factors that contribute to the processes of soil formation (Brady 1974).[4] The relative importance of each soil-forming factor on the properties of a soil vary widely. For example, age has a much greater influence on the properties of an older soil than of a very young one; poor drainage (largely controlled by topography) tends to subdue the other soil-forming factors. Detailed discussions of the soil-forming factors and their interactions can be found in Buol et al. (1973)[5] and Simonson (1978).[6]

Because most of the survey area was covered by Wisconsin glacial drifts and the elevation throughout the survey area was relatively low, three of the five soil-forming factors—climate, vegetation, and age—played minor roles in differentiating the various soils found on this surveyed area. Therefore, the differences among the soils of this area are mainly attributed to the difference of parent material and topography (drainage).

In this report, all soils are classified according to *The Canadian system of soil classification* (Canada Soil Survey Committee 1978).[3] Technical terms are defined in the *Manual for describing soils in the field* (Agriculture Canada 1978)[7] and *Glossary of terms in soil science* (Agriculture Canada 1976).[8] These three publications are also available in French.

The surveyed area, which falls within the region generally known as the Eastern Lowlands, can be subdivided into four zones (Fig. 4).

Eastern coastal plain

This plain occupies the eastern half of the survey area. It is level except for small areas of dissected marine clay, which are usually along tidal rivers and have a hummocky appearance. It is less than 40 m above sea level.

Three kinds of parent materials are found in this coastal plain: marine-modified outwash sand, organic matter (bogs), and marine clay. There are also minor amounts of alluvium and till. The mineral soils (except alluvium) are about 10 000 years old. In the sandy soils, concentrations of organic matter and amorphous Al and Fe are evident in the B horizons, and most of them are Humo-Ferric Podzols. The marine clays are about the same age as the sandy soils. However, besides the concentrations of organic matter and amorphous Al and Fe, the marine clays have oriented clay in the lower B horizon, and when found on level landforms, commonly have gleyed horizons. The soils developed in marine clays are therefore mostly Podzolic Gray Luvisols and Luvic Gleysols. The organic matter parent materials are mostly associated with domed bogs. The age varies from over 7000 years old near the bottom of the bog to less than 1000 years old near the surface. Most of the organic soils are classified as Typic Fibrisols.

Areas of ortstein soils, which have cemented podzolic B horizons (Wang et al. 1978),[9] are common on the outwash sands of this zone.

Central till plain

With the exception of small patches of lacustrine and outwash material, this zone is covered mainly by a gently undulating to slightly rolling ground moraine. Elevations are 40–100 m above sea level.

The dominant type of parent material found in this zone consists of two materials in a thin mantle 30–50 cm thick of friable, acid, fine loamy, brownish, ablational till overlying a compact, acid, fine loamy, reddish, lodgment till. In well and imperfectly drained soils, there is a podzolic B horizon in the friable ablational till and a luvisolic B horizon in the compact lodgment till. For soils developed on poorly drained sites the podzolic B is weak or nonexistent, but the luvisolic B is usually still moderately well developed in the lodgment till.

Gray Luvisol and Luvic Gleysol are common where minor areas of lacustrine clay occur, and Humo-Ferric Podzols are most commonly found on areas of outwash sand and thick ablational till.

All the luvisolic B horizons found in this zone are weak, and all the luvisolic B horizons found in the Maritime provinces are usually weak ones. Generally, the Bt horizons that developed in the marine clays of the eastern coastal plain and in the lacustrine clays of the northern basin are better developed than those in the lodgment till of this zone.

Northern basin

The landforms within this zone are level to slightly undulating, except for areas dissected by rivers and streams. Elevations are usually less than 40 m above sea level.

The dominant parent material is lacustrine clay, with smaller but significant areas of glacial till and outwash materials. The lacustrine material is clayey, compact, weakly calcareous, and brownish in color. It has a higher natural fertility than the acid, fine loamy till that commonly occurs on both central and western till plains. However, owing to the heavy texture and flat topography, most soils developed on this type of lacustrine material are either poor or imperfectly drained, with Luvic Gleysols and Gray Luvisols being the soils most commonly formed. The till found in this area is similar to the dominant type of till found in the central till

[3]Canada Soil Survey Committee. The Canadian system of soil classification. Ottawa, Ont.: Supply and Services Canada. Can. Dep. Agric. Publ. 1646; 1978: 164 p.
[4]Brady, N. C. The nature and properties of soils. 8th ed. New York: MacMillan Publishing Co. Inc.; 1974: 639 p.
[5]Buol, S. W.; Hale, F. D.; McCracken, R. J. Soil genesis and classification. Ames, IA: The Iowa State Univ. Press; 1973.
[6]Simonson, R. W. A multiple-process model of soil genesis. Quaternary soils. Norwick, Eng.: Geo. Abstracts; 1978: 1-25.
[7]Agriculture Canada. Manual for describing soils in the field. Dumanski, J., ed. Ottawa, Ont.: Land Resource Research Institute; 1978.
[8]Agriculture Canada. Glossary of terms in soil science. Can. Dep. Agric. Publ. 1459. rev. 1976.
[9]Wang, C.; Beke, G. J.; McKeague, J. A. Site characteristics, morphology and physical properties of selected ortstein soils from the Maritime provinces. Can. J. Soil Sci. 58:405-420; 1978.

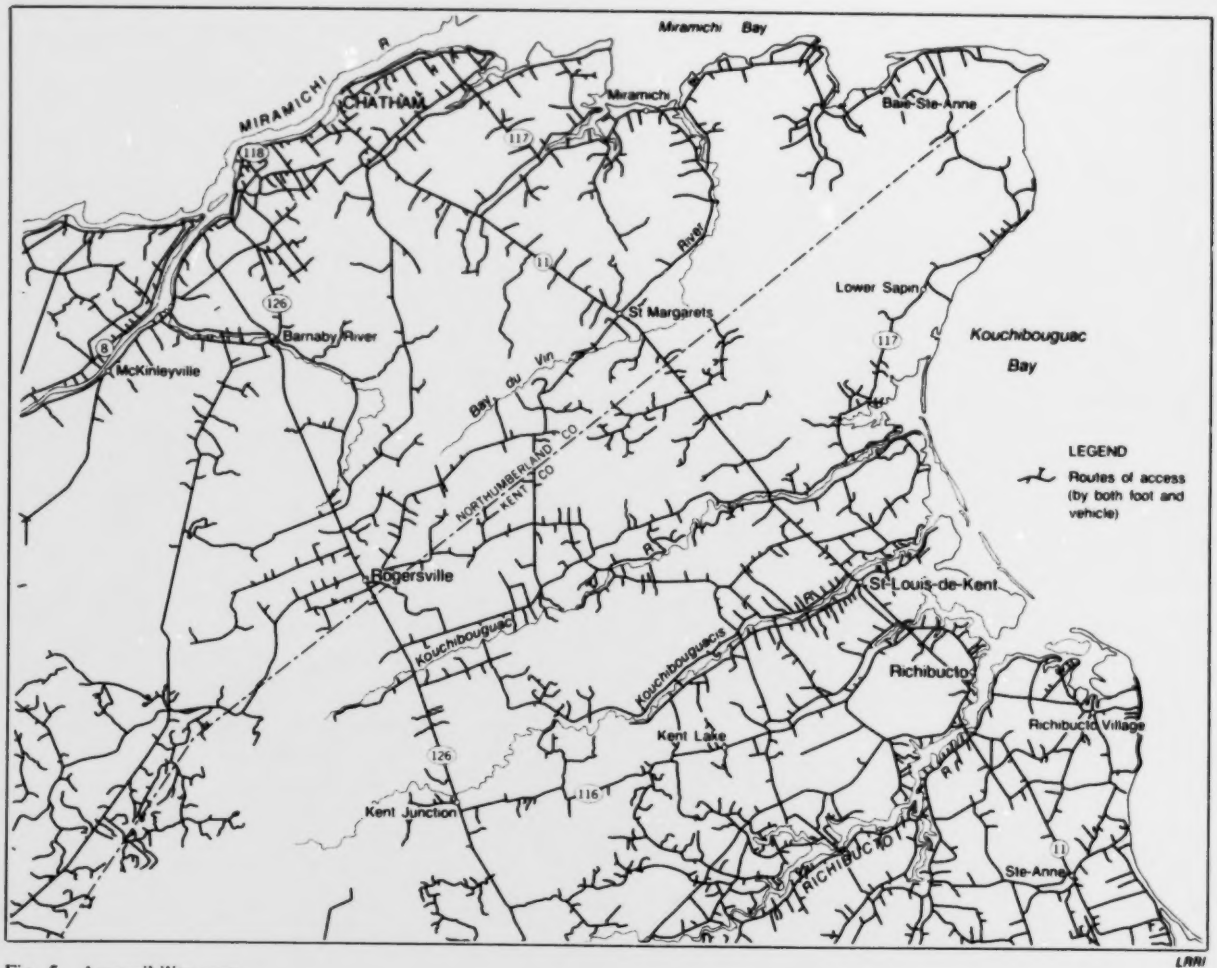


Fig. 5 Accessibility map

plain. The outwash material found here is similar to the outwash sand found in the eastern coastal plain. Consequently, the soils developed on these materials are also similar to those in the other two zones on comparable topography.

Western till plain

This zone consists of a slightly undulating to undulating ground moraine plateau. It is 50–140 m above sea level.

The reddish fine loamy lodgment till that dominates the Central Till Plain is rarely found here. Instead, an acid, fine loamy, somewhat compact, brownish lodgment till is most common; also very common is a layer of 30–60 cm of acid, coarse loamy, friable, ablational till overlying the acid, fine loamy, brownish lodgment till. Most of the soils developed on these tills have a weakly to moderately developed fragipan with characteristics similar to the ones described by Wang et al. (1973).[10] There are significant accumulations of organic matter and amorphous Al and Fe in the B horizons of these soils. However, accumulations of silicate clay in the B horizons are not well pronounced.

In this zone, there is a significant area of organic matter parent material, mostly in the form of domed bogs. Morphologically, the organic soils developed on these bogs were similar to the organic soils found on the eastern coastal plain. However, the ages of the bogs vary, with these being older than the bogs on the eastern central plain.

Survey method

Field data collected during the summer months consisted of routine observations of the soil, which were located and recorded on aerial photographs (scale 1 cm to 0.32 km or 1:31 680). With the use of the road system in the region as a basis, examinations of the soil were made at about 0.4-km intervals, which varied with the simplicity or complexity of landforms in each area. Because the survey was heavily dependent on accessibility, the areas of intensive use (farm fields and cleared land) were mapped in greater detail. The accessibility map (Fig. 5) reflects the intensity of observation

[10] Wang, C.; Nowland, J. L.; Kodama, H. Properties of two fragipan soils in Nova Scotia including scanning electron micrographs. Can. J. Soil Sci. 54:159-170; 1973.

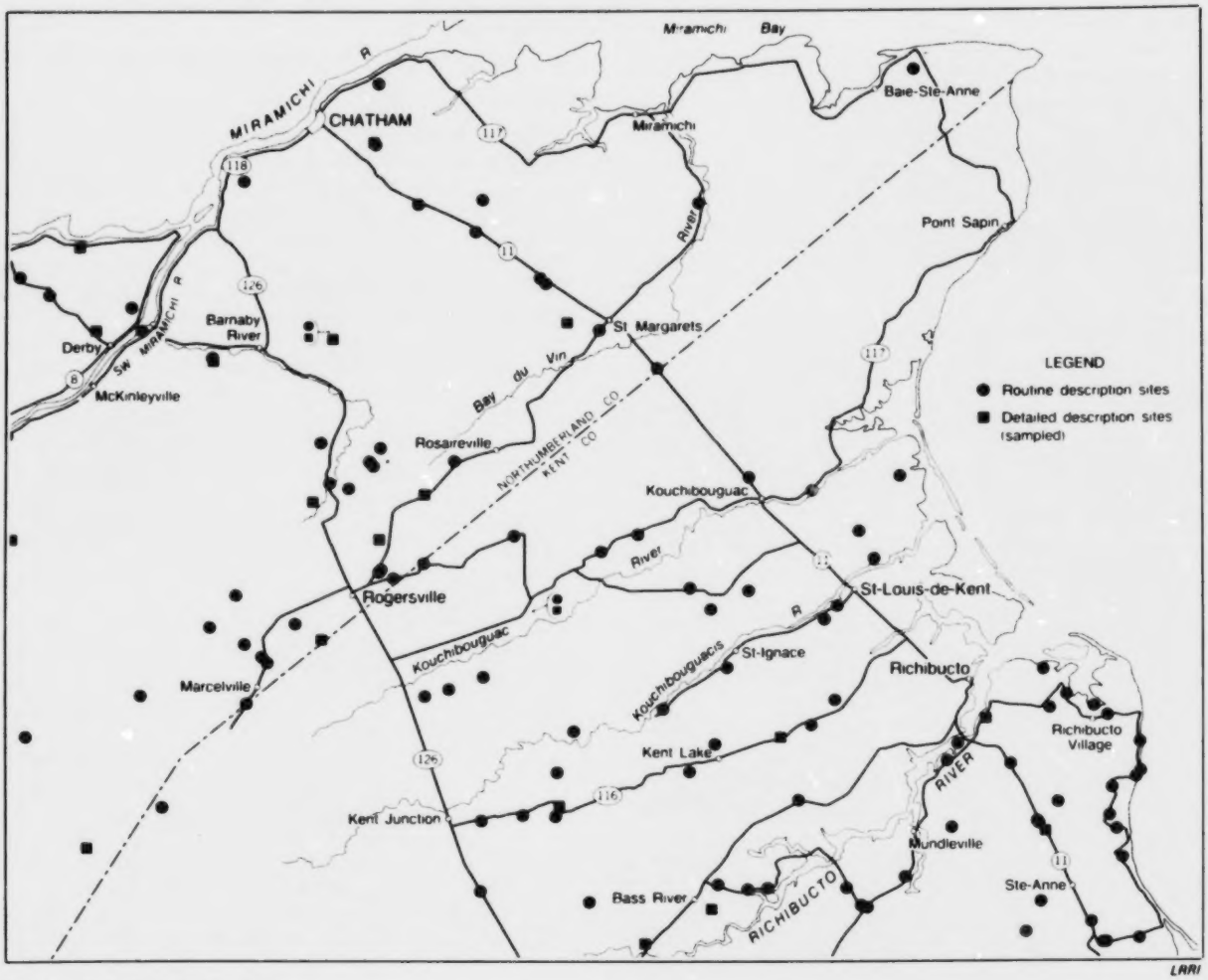


Fig. 6 Soil description sites

of the survey area. In most cases a pit was dug to expose the soil profile, but where possible (in stone-free material), an auger or probe was used. Such identifications involved the soil to a depth of 1 m for mineral soil and 160 cm for organic soil or to a lithologic contact in shallow soils.

Soil delineation lines were drawn on the aerial photos in the field, where possible. However, because the majority of the area is wooded, most of the soil delineation lines were located under stereoscopic examination. Photo interpretation played a major role in delineating the various soils as did the field observations. These two factors, along with the surveyor's familiarity of the area, were the basis for determining the locations of the boundaries. Some soil changes are more obviously marked in nature and can be delineated accurately; others are gradual and the boundary lines are not sharp or well defined.

During the survey season, one or two detailed soil descriptions per field party were made each week on the soil or soils that occurred most often during that week (Fig. 6). Some common soil mapping units may have many detailed soil descriptions in one season. This provides an accurate estimate on the range of characteristics of soil mapping units over four field seasons. However, the minor soils may have only very few descriptions over the years and consequently have a less accurate range of soil characteristics.

By the end of each survey season, the most commonly occurring soils were sampled at 5–10 sites for chemical and physical analysis. Also each season, 10–20 soil parent material samples of major soils were sent for testing of engineering properties. Figure 7 shows the sampling sites; Chapter 5 gives the results of the analyses and tests.

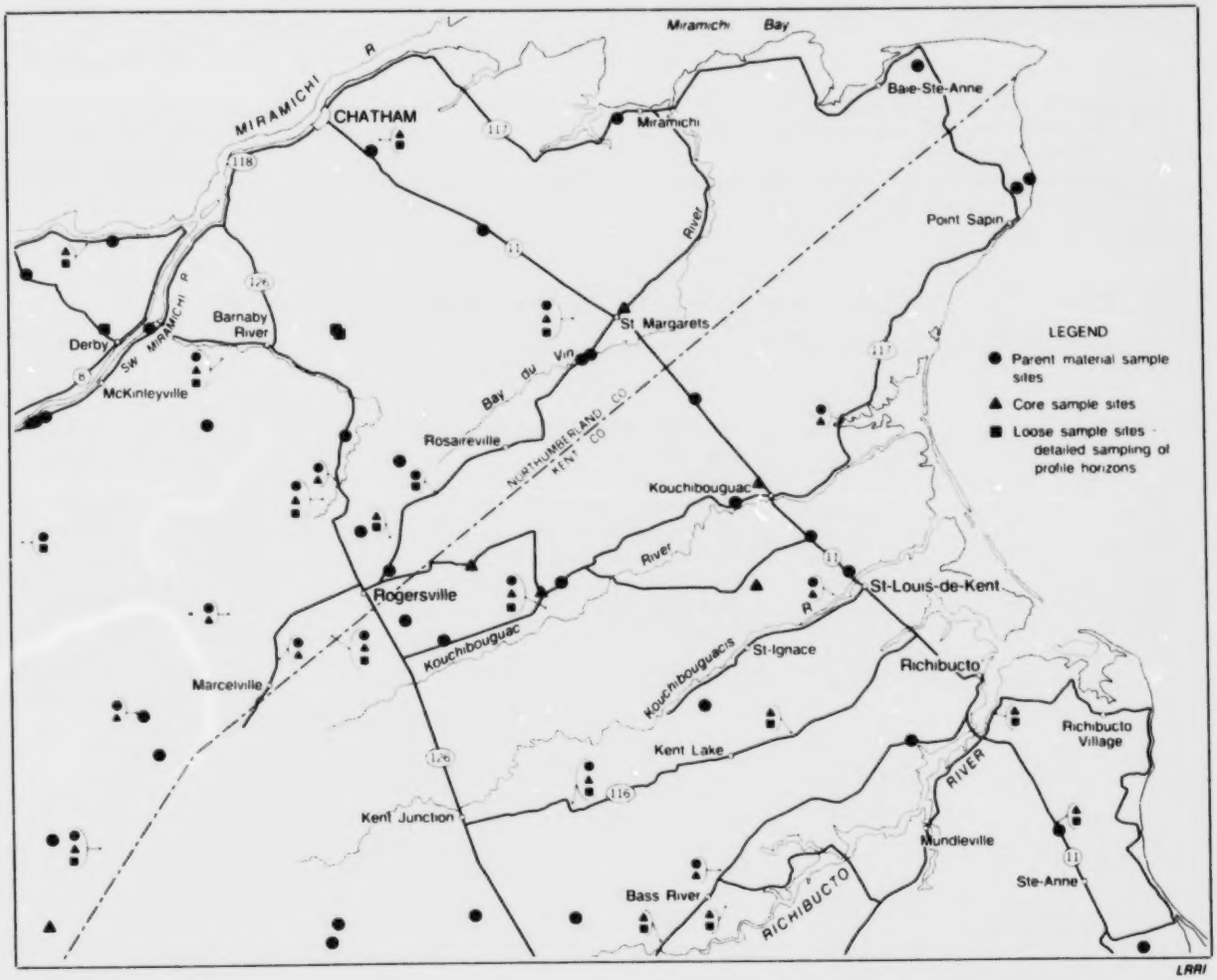


Fig. 7 Soil sample sites

CHAPTER THREE: THE SOIL MAP LEGEND AND GENERAL CHARACTERISTICS OF THE SOIL ASSOCIATIONS

The generalized soil map legend follows. There are twenty-four mineral soil associations, four organic soil associations, and three land types.

A soil association is considered in this report to be a natural grouping of soil associates based on similarities in physiographic factors and parent materials. It usually includes a number of soil associates (as indicated by numeric modifier on page 17), provided they are all present in significant proportions. A soil associate is a cartographic grouping of soils or land segments that combines related soils into units having similarity in geographic position.

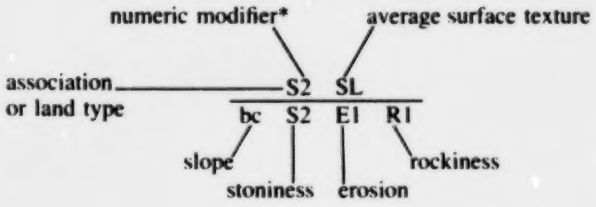
The mapping unit is defined on page 17.

Generalized soil map legend for the Rogersville–Richibucto region

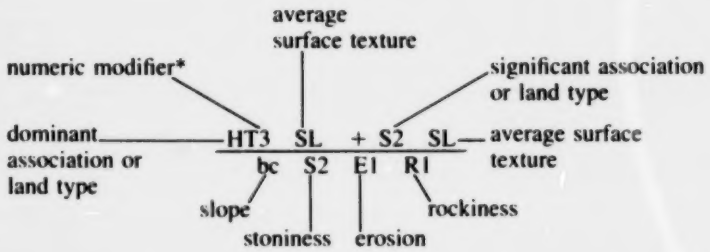
Soil association or land type	*Symbol*	*Soil or nonsoil material*
Acadie Siding	AS	less than 160 cm of humic or mesic fen peat over undifferentiated mineral material
Baie-du-Vin	BV	10–50 cm of sandy glaciofluvial material over sandstone
Barrieau	BA	20–50 cm of sandy glaciofluvial over fine loamy lodgment till
Big Hole	BH	10–50 cm of coarse loamy ablational till over sandstone
Buctouche	BU	50–100 cm of sandy glaciofluvial over fine loamy lodgment till
Caraquet	CR	50–100 cm of sandy glaciofluvial over clayey marine material
Chelmsford	CM	more than 160 cm of humic or mesic fen peat
Fair Isle	FA	50–100 cm of coarse loamy ablational till over sandstone
Fundy	FU	clayey lacustrine or marine material
Gagetown	G	sandy skeletal glaciofluvial material over sandstone
Galloway	GA	50–100 cm of sandy glaciofluvial material over sandstone
Guimond River	GR	sandy skeletal glaciofluvial material
Harcourt	HT	30–45 cm of fine loamy ablational over lodgment till
Interval	IN	coarse silty alluvium
Kouchibouguac	KO	sandy glaciofluvial material
Lagacéville	LG	less than 160 cm of fibric sphagnum peat over undifferentiated mineral material
Lavillette	LV	more than 160 cm of fibric sphagnum peat
Lord and Foy	LF	sandy skeletal glaciofluvial material
Marsh	—	undifferentiated marine deposits along coast or tidal river, periodically submerged by salt water
Mount Hope	MH	clayey glaciomarine material
Reece	RE	40–60 cm of coarse loamy ablational over fine loamy lodgment till
Richibucto	RB	sandy glaciofluvial material
Riverbank	R	sandy glaciofluvial material
Rockland	RK	less than 10 cm of unconsolidated material over mainly sandstone bedrock
Rogersville	RS	fine loamy lodgment till
Sandy beach	—	sandy marine beach periodically submerged by salt water
St. Gabriel	SG	50–100 cm of fine loamy till over sandstone
Stony Brook	SB	fine loamy lodgment till
Sunbury	S	coarse loamy ablational till
Tracadie	TD	clayey marine material
Upper Caraquet	UC	20–50 cm of sandy glaciofluvial over marine clay

Explanation of mapping unit symbols on the soil map

Single mapping unit



Complex mapping unit



In a complex mapping unit, the first soil association is the most dominant, i.e., more than 40%, followed by one or two significant (20–40%) soil associations.

*Numeric modifiers for soil associations:
1. Well and excessively drained
2. Dominantly (40–80%) well drained with significant (20–40%) imperfectly drained
3. Dominantly imperfectly drained with significant well drained
4. Imperfectly drained
5. Dominantly imperfectly drained with significant poorly drained
6. Dominantly poorly drained with significant imperfectly drained
7. Poorly drained
8. Very poorly drained

GENERAL CHARACTERISTICS OF EACH ASSOCIATION

Acadie Siding Association (AS)

Soil unit: AS—dominantly either Terric Humisol or Terric Mesisol or both, and always poorly drained

General

Acadie Siding is a minor organic soil association both in the size of its area and in its agricultural or commercial importance. There are about 11 891 ha, 2.85% of the survey area. Although the total area of this soil is small, it is scattered over the whole map area.

Acadie Siding soils are extremely acid, with 60–160 cm of organic material over mineral material (terric layer). The organic material is dominantly sphagnum, but some sedge, woody, and shrubby materials may be present. In the middle and lower tiers, the organic material is moderately to well decomposed and the rubbed fiber content is less than 40% by volume; the upper tier may or may not be significantly decomposed. The terric layer varies widely in texture; it is usually slightly heavier than the texture of the surrounding mineral soils (see Fig. 8).

This association usually is closely associated with fens. The age of the fens is not known, but we believe that in a similar climatic zone, the fens are probably somewhat younger than the bogs.

Associated soil unit

Acadie Siding is most often associated with Chelmsford soil, which is similar to Acadie Siding except for the lack of terric contact (Fig. 9). It is also associated with poorly drained mineral soils.

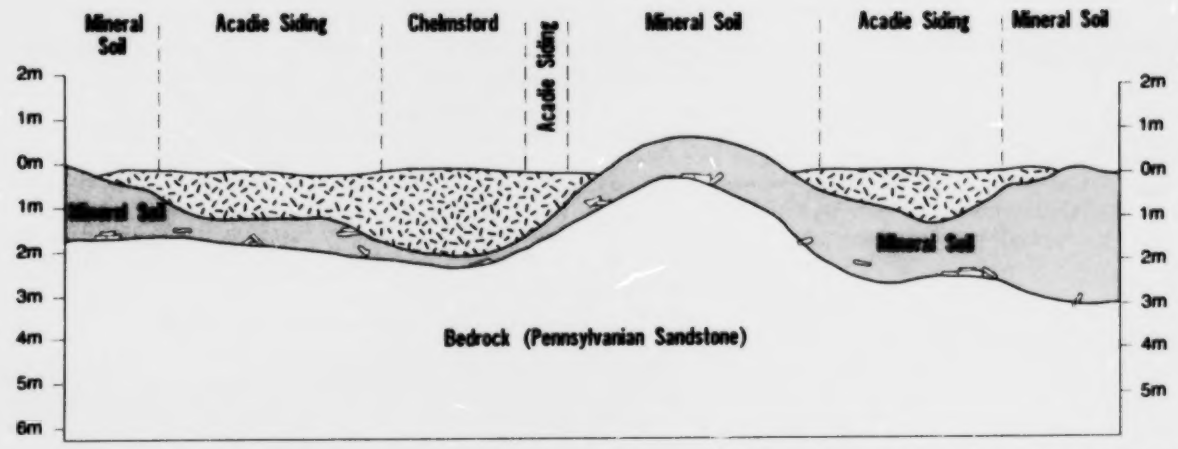


Fig. 8 Sketch of the landscape relationships between the Acadie Siding and Chelmsford associations and associated soilscapes

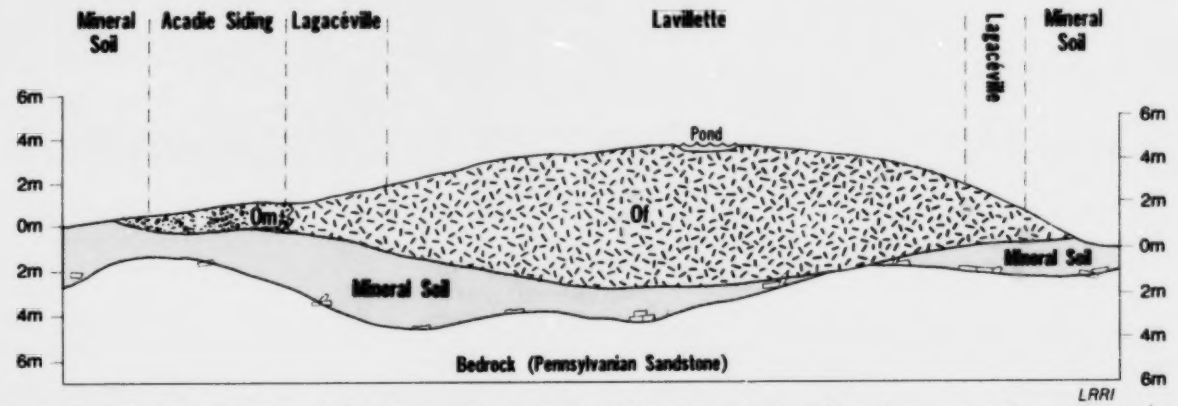


Fig. 9 Sketch of the landscape relationships among the Acadie Siding, Lagacéville, and Lavillette associations and associated soilscapes

Baie-du-Vin Association (BV)

Soils units: BV1, BV2 —dominantly Orthic Humo-Ferric Podzol

BV3, BV4, BV5 —dominantly Gleyed Humo-Ferric Podzol

BV6, BV7 —dominantly Gleyed Eluviated Dystric Brunisol

General

Baie-du-Vin association is commonly found on the southeast section of the survey area and some is also found in the northeast section. There are 13 989 ha, about 3.35% of the map area. Almost all the Baie-du-Vin soils are mapped at less than 50 m above sea level.

Baie-du-Vin soils are very shallow lithic, well-sorted marine-influenced outwash sand over Pennsylvanian sandstone bedrock. These soils usually occur on nearly level (0.5–2.5% slope) coastal plain. The sandy outwash layer is 10–50 cm thick, acidic, petrologically similar to the underlying sandstone, and rich in biotite. It is generally free of coarse fragments, but may contain as much as 20% by volume of sandstone gravel and cobbles.

The upper 50–100 cm of the sandstone bedrock is easily split, can even be broken by hand, and there are many fracture planes between rocks. However, at a greater depth, the rocks become much harder and the fracture planes fewer.

The well-drained and imperfectly drained members of this association usually have a Bf horizon that just meets the thickness and chemical requirements for a podzol. However, they may be underlain by a Bfj horizon morphologically almost identical with the overlying Bf horizon. The poorly drained member usually does not meet the requirements of a podzolic soil.

Associated soil unit

Baie-du-Vin soils are commonly found in association with soils of the Richibucto and Galloway associations (Fig. 10).

All three soil associations are developed on the same type of outwash sand over sandstone bedrock and all are found mainly on the Eastern Coastal plain. However, Baie-du-Vin has only 20–50 cm of outwash sand, whereas Gallo-

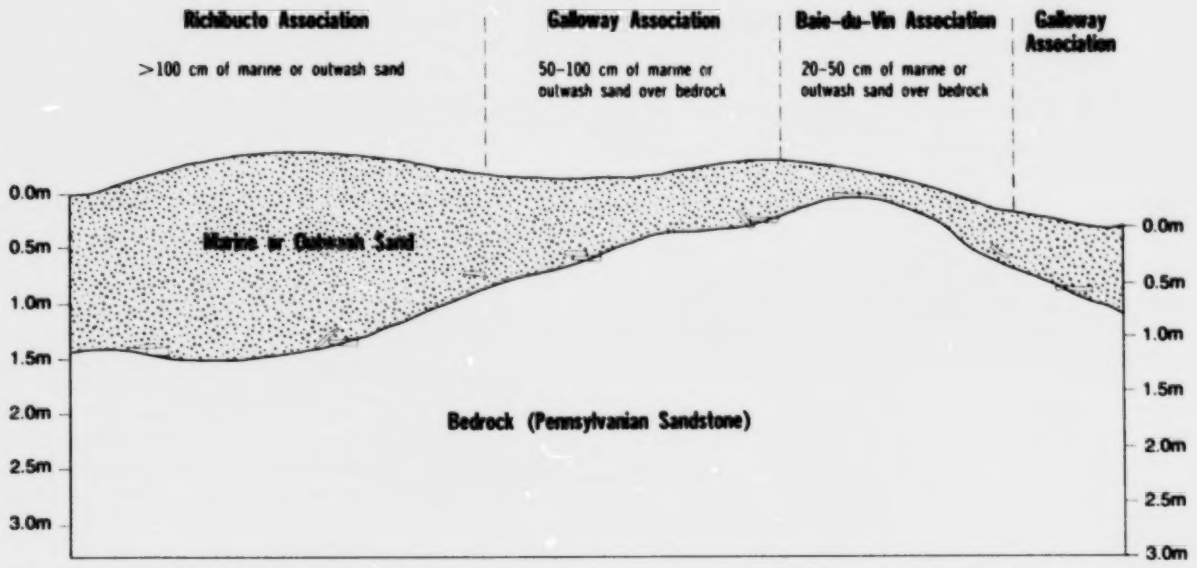


Fig. 10 Sketch of the landscape relationships among the Baie-du-Vin, Galloway, and Richibucto associations and associated soilscapes

way has 50–100 cm and Richibucto has more than 100 cm over bedrock.

As a result of frost heaving, root action, tree throw, or plowing, coarse fragments of platy bedrock are often moved upward into the profile; therefore, Baie-du-Vin soils often have more coarse fragments (sandstone) than either Richibucto or Galloway soils. Where the coarse fragments increase, the sand layer has the appearance of ablational till, which can be mistaken for Big Hole soils. However, the Big Hole soils are rarely found on the coastal plain and they have a more undulating surface expression.

Barrieau Association (BA)

Soil units:
- BA2 —dominantly Orthic Humo-Ferric Podzol
- BA3, BA4, BA5 —dominantly Gleyed Humo-Ferric Podzol
- BA6, BA7 —dominantly Orthic Gleysol

General

The Barrieau association is widespread in this region (23 067 ha, 5.52% of the map area). Most of this association is mapped as poorly drained soil units (BA6 and BA7) in the northeast of the map area. Minor areas of well-drained and imperfectly drained units are scattered over the map. They are usually near or along the rivers. Most of the Barrieau soils are at 20–40 m above sea level.

Barrieau soils are developed on very shallow well-sorted marine-modified outwash sand over dense lodgment till. They are usually associated with almost level (0.5–2.5% slope) landforms, except for some small sloping areas along the rivers. The outwash sand layer is about 20–50 cm thick, mostly fine and medium sand, free from coarse fragments, acidic, and rich in biotite. The underlying till is very dense, fine loamy, acidic, and commonly has 10–20% coarse fragments, nearly all sandstone. Sources of the till are mainly Pennsylvanian sandstones, red shale, and siltstone.

The well-drained and imperfectly drained members of this association usually have a Bf horizon that just meets the thickness and chemical requirements for a podzol. However, the Bf may be underlain by a Bfj horizon that is morphologically almost identical. The poorly drained member usually does not meet the requirements of a podzolic soil.

Associated soil unit

Barrieau soils are commonly associated with soils of the Buctouche association (Fig. 11). Both Barrieau and Buctouche associations are developed on the same type of shallow outwash sand over the same kind of lodgment till, but the sand layer is only 20–50 cm thick in Barrieau soils, whereas it is 50–100 cm in Buctouche soils.

Big Hole Association (BH)

Soil units:
- BH1, BH2 —dominantly Humo-Ferric Podzol
- BH3, BH4 —dominantly Gleyed Humo-Ferric Podzol

General

Only relatively small areas (3121 ha, 0.75% of the area) have been mapped as Big Hole association. Many of them are found near or along rivers. They usually occur at 40–120 m above sea level.

Big Hole soils are very shallow, developed in thin ablational till over Pennsylvanian sandstone bedrock, and usually occur on undulating to rolling (3–15%) landforms. The ablational till overlay is about 10–50 cm thick, coarse loamy, acidic, and contains about 10–40% coarse fragments. Usually all the coarse fragments are angular and subangular,

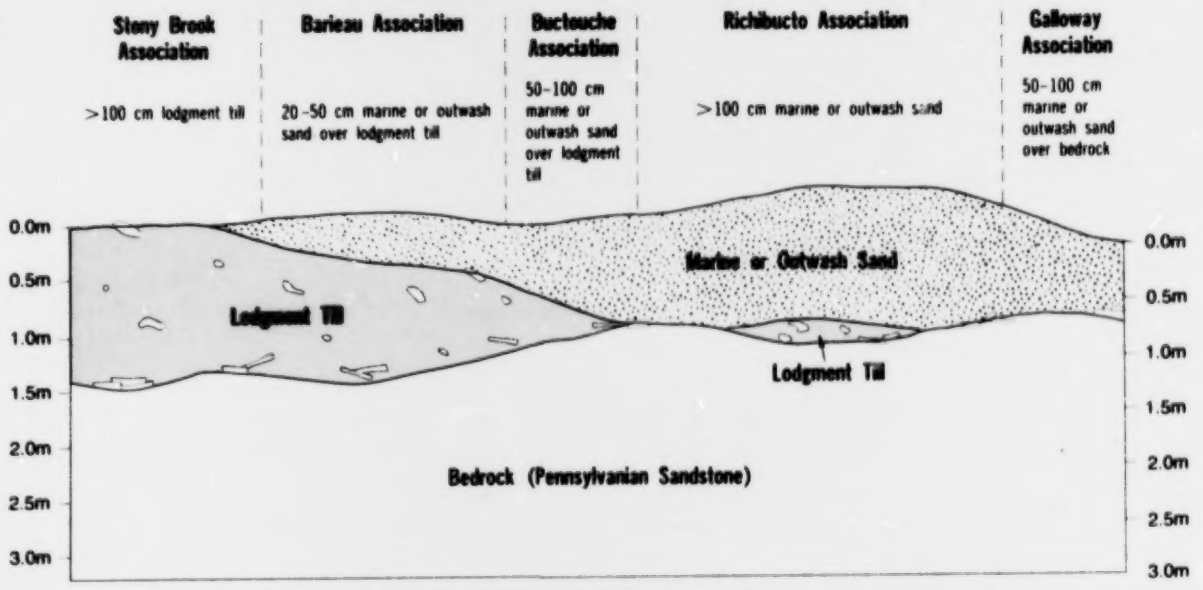


Fig. 11 Sketch of the landscape relationships among the Barrieau, Buctouche, and Richibucto associations and associated soilscapes

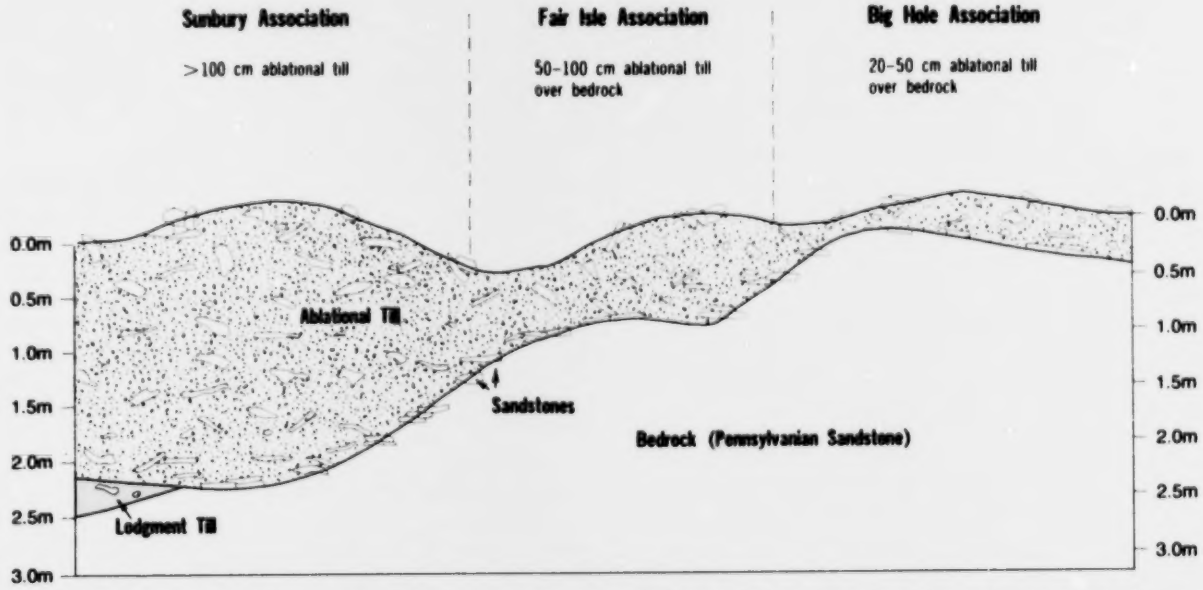


Fig. 12 Sketch of the landscape relationships among the Big Hole, Fair Isle, and Sunbury associations and associated soilscapes

platy Pennsylvanian sandstone in cobble and gravel size. The first 50 cm of the sandstone bedrock has many fracture planes and is easily split. The sandstone becomes harder and the fracture planes disappear with depth. Usually there is a significant amount of surface stone (stony phase 1–3) associated with this association.

Associated soil unit

Big Hole soils are commonly associated with soils of Sunbury and Fair Isle associations (Fig. 12).

All three soil associations are developed on the same type of ablational till over Pennsylvanian sandstone bedrock, but Big Hole soils have only 20–50 cm of till, Fair Isle has 50–100 cm, and Sunbury has 100 cm.

Sometimes, the very shallow ablational till of Big Hole is difficult to differentiate from the very shallow outwash material of the Baie-du-Vin association. However, the Baie-du-Vin soils are associated with the almost level coastal plain and rarely occur at over 30 m above sea level.

Buctouche Association (BU)

Soil units:		
	BU2	—dominantly Orthic Humo-Ferric Podzol
	BU3, BU4, BU5	—dominantly Gleyed Humo-Ferric Podzol
	BU6, BU7, BU8	—dominantly Orthic Gleysol

General

Buctouche soils are common in this region (16 607 ha, 3.97% of the map area). They occur mostly on the northeast section of the map area, but some are found also on the northwest and southeast of the map. Most of the Buctouche soils are at 10–60 m above sea level.

Buctouche soils are developed on shallow, well-sorted marine-modified outwash sand over dense lodgment till. The landform is almost level to undulating (0.5–5% slope). The outwash sand layer is 50–100 cm thick, mostly fine and medium sand, free of coarse fragments, acidic, and rich in biotite. The underlying till is very dense, fine loamy, acid, and commonly has 10–20% coarse sandstone fragments that are mostly of cobble and stone size. Sources of the underlying till are mainly Pennsylvanian sandstones, red shale, and siltstone.

The well-drained and imperfectly drained members of this association usually have a Bf horizon that just meets the thickness and chemical requirements for a podzol. However, they may be underlain by a Bfj horizon morphologically almost identical with the overlying Bf horizon. The poorly drained member usually does not meet the requirements of a podzolic soil and is classified as an Orthic Gleysol.

Associated soil unit

Buctouche soils are commonly associated with soils of the Barrieau association (Fig. 11).

Both Buctouche and Barrieau soils are developed on the same type of outwash and over the same kind of lodgment till. However, the outwash sand layer is 50–100 cm thick in Buctouche soils and only 20–50 cm thick in Barrieau.

Caraquet Association (CR)

Soil units:		
	CR2	—dominantly Orthic Humo-Ferric Podzol
	CR3, CR4, CR5	—dominantly Gleyed Humo-Ferric Podzol
	CR6, CR7	—dominantly Orthic Gleysol

General

The Caraquet soil association is of minor extent in this region (5945 ha, 1.42% of the map area); it is found mostly near the northeast coast. These soils usually have severe drainage problems. They are found below 30 m above sea level.

Caraquet soils are developed on shallow, well-sorted marine-modified outwash sand over dense marine and lacustrine clay. They usually occupy an almost level landform (0–2% slope). The outwash sand layer is about 50–100 cm thick, mostly fine and medium sand, free of coarse fragments, acidic, and rich in biotite. The underlying marine clay is dense, acidic to neutral at about 2 m below the surface, and free from coarse fragments.

The well-drained and imperfectly drained members of this association usually have a Bf horizon that just meets the thickness and chemical requirements for a podzol. However, they may be underlain by a Bfj horizon morphologically almost identical with the overlying Bf horizon. The poorly drained member usually does not meet the requirements of a podzolic soil.

Associated soil unit

Caraquet soils are commonly associated with soils of the Upper Caraquet association (Fig. 13).

Both Caraquet and Upper Caraquet soils are developed on the same type of outwash sand over marine and lacustrine clay. However, the outwash sand layer is 50–100 cm thick in Caraquet soils and only 25–50 cm thick in Upper Caraquet.

Chelmsford Association (CM)

Soil unit:		
	CM	—typic Humisol or Typic Mesisol or both and always poorly drained

General

Because of its limited area and more advanced decomposition stage, this organic soil has limited importance or commercial value. Although there are 3702 ha covering 0.89% of the survey area, it is rarely found in large blocks. It was found at nearly all elevations of the surveyed area.

Chelmsford soils are extremely acid; the organic material is dominantly sphagnum, but there are some sedge, woody, and shrubby materials. In the middle and lower tiers, the organic material is fairly well decomposed, the rubbed fiber content is less than 40% by volume, and the bulk density is more than 0.1 g/cm^3; the upper tier may or may not be significantly decomposed.

The association is usually closely associated with fens. The age of the fens is not known, but we believe that in a similar climatic zone, the fens are somewhat younger than the bogs.

Associated soil unit

Chelmsford is most often associated with Acadie Siding soil, which is very similar to Chelmsford soil, but the shallow sand over the mineral material (terric layer) is 60–160 cm deep (Fig. 8). Also it is commonly associated with poorly drained mineral soils.

Fair Isle Association (FA)

Soil units: FA1, FA2 —dominantly Humo-Ferric Podzol
FA3, FA4 —dominantly Gleyed Humo-Ferric Podzol

General

A relatively minor soil association of this region (6983 ha, 1.67% of the map area), Fair Isle soils are commonly found near rivers. However, the Fair Isle association is also found on terrains with a till veneer and no rivers nearby. These soils usually occur at 40–140 m above sea level.

Fair Isle soils are shallow lithic with thin ablational till over Pennsylvanian sandstone bedrock and usually associated with undulating to rolling (3–15% slope) landforms. The overlain ablational till is about 50–100 cm thick, coarse loamy, acidic, and with about 10–40% coarse fragments consisting mostly of cobbles with some gravel and stones. Usually all the coarse fragments are angular and subangular, flaggy Pennsylvanian sandstone. The first 50 cm of the sandstone bedrock is easily split and has many fracture planes, but at greater depth the sandstone becomes harder and the fracture planes disappear. Usually there are significant amounts of surface stone (stony phase 1–3) associated with this association.

Associated soil unit

Fair Isle soils are commonly associated with soils of Sunbury and Big Hole associations (Fig. 12).

All three soil associations are developed on some type of ablational till over Pennsylvanian sandstone bedrock. However, Fair Isle soils have 50–100 cm of till, Big Hole soils have 25–50 cm of till, and Sunbury soils have more than 100 cm of till over bedrock.

Fundy Association (FU)

Soil units: FU4, FU5 — dominantly Gleyed Brunisolic Gray Luvisol
FU6, FU7, FU8 — dominantly Humic Luvic Gleysol

General

The Fundy association is commonly found in the northern half of the map area. There are 20 708 ha or about 4.96% of the map. The soils are imperfectly and poorly drained; no well-drained soil units of this association have been mapped in this region. The Fundy association is found only at below 35 m above sea level.

Fundy soils are developed from lacustrine clay on level or almost level plains. Where the lacustrine plains are dissected by rivers or creeks, Fundy soils are found on much steeper slopes. The lacustrine parent material is neutral (the pH increases with depth) and usually more than 2 m thick.

Because of the uniformity in landform, parent material, and drainage, a single delineation of a Fundy soil unit often covers a large area. In many places, the boundary of these delineations is marked by a low (30–60 cm) gravelly or sandy beach ridge (Fig. 14), which appears to be the remains of a lakeshore or strandline.

From the geographical position of the Fundy soils, it is logical to expect that the lacustrine material was subject to some marine reworking.

Associated soil unit.

Soils of Upper Caraquet and Caraquet associations are commonly associated with Fundy soils (Fig. 13). Upper Caraquet soils have a 25–50 cm sand layer over marine or lacustrine clay or both and Caraquet soils have a 50–100 cm sand layer over marine or lacustrine clay or both.

Mount Hope (reworked marine clay) and Tracadie (marine clay) soils are similar in texture to Fundy soils, but they are redder and the Tracadie soil is alkaline in the control section.

Gagetown Association (G)

Soil units: G1, G2 —dominantly Orthic Humo-Ferric Podzol
G3, G4, G5 —dominantly Gleyed Humo-Ferric Podzol
G6 —dominantly Gleyed Humo-Ferric Podzol

General

In spite of the small area (976 ha, 0.23% of map area), the Gagetown soils are important as a source of high quality gravel, which is rare in this region. The largest concentration of Gagetown soils are located near the center of the map area, northwest of the small village of Rosaireville. Smaller areas are also found along the Miramichi River and west of Despres Lake in the southwest section of the map, but these are usually too small to delineate at the published map scale. No Gagetown soils were mapped along the east coast.

Gagetown soils are developed on well-sorted glaciofluvial material, associated with a wide range of landforms from almost level outwash plain and river terraces to hummocky kames and eskers and low beach ridges. The parent material is loose gravelly and very gravelly sand, acidic, and usually more than 2 m thick. The coarse fragments (rounded gravel, 40–80% with the majority over 60%) are dominated by hard rocks such as quartzite, granite, gneiss, schist, diorite, and siltstone with minor amounts of softer rocks such as Pennsylvanian sandstones and shale.

Associated soil unit

Gagetown soils are commonly associated with Riverbank soils (Fig. 15), which occur on the same kind of landforms and materials. These two associations are often mapped in a complex mapping unit. Riverbank soils, unlike Gagetown, contain less than 20% coarse fragments, and often less than 5%.

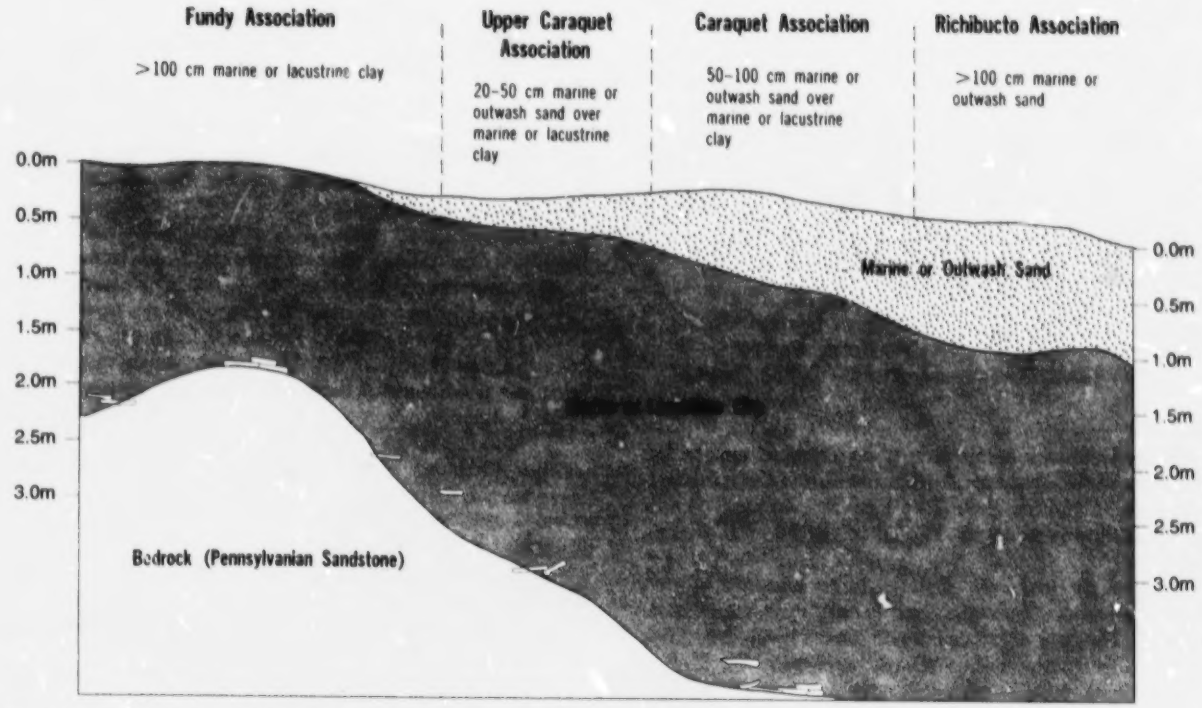


Fig. 13 Sketch of the landscape relationships among the Caraquet, Fundy, and Upper Caraquet associations and associated soilscapes

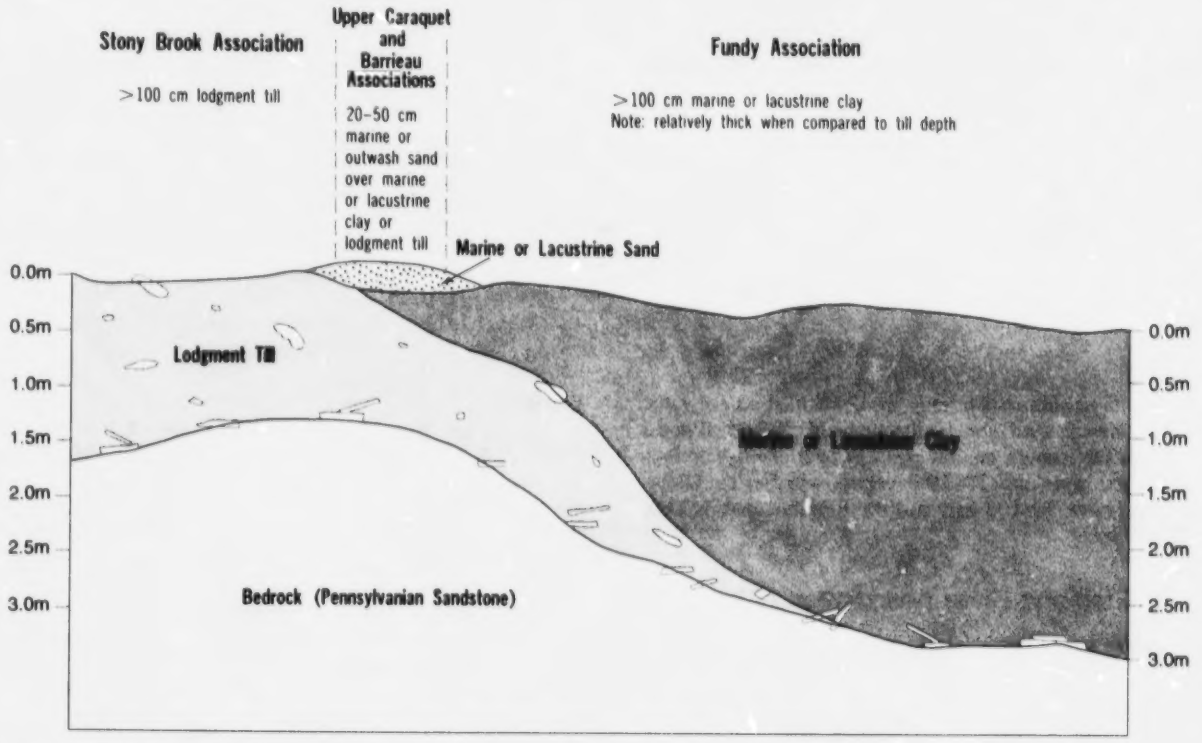


Fig. 14 Soilscape of the Fundy association with characteristic low beach ridge

The Guimond River association occupies similar landforms and has similar texture to the Gagetown association. However, Guimond River materials are dominated by soft round gravel of Pennsylvanian sandstone and, therefore, a poorer quality of gravel than Gagetown material.

Galloway Association (GA)

Soil units: GA1, GA2 —dominantly Orthic Humo-Ferric Podzol
GA3, GA4, GA5 —dominantly Gleyed Humo-Ferric Podzol
GA6, GA7 —dominantly Orthic Gleysol

General

The Galloway association is commonly found in the southeast of the map area, with some also in the northeast. There are 31 184 ha, about 7.46% of the map area. Almost all the Galloway soils are located below 50 m above sea level.

Galloway soils are shallow lithic with well-sorted marine-influenced outwash over Pennsylvanian sandstone bedrock. They are found usually on almost level (0.5–2.0% slope) coastal plains. The outwash layer is sandy (mostly fine and medium), 50–100 cm thick, acidic, petrologically similar to the underlain sandstone bedrock, and rich in biotite. It is usually free of coarse fragments, but could have up to 20% coarse sandstone fragments.

The upper 50–100 cm of the underlying sandstone bedrock is easily split, can be broken by hand, and there are many fracture planes. However, below 100 cm the rocks become much harder and the fracture planes are greatly decreased.

The well-drained and imperfectly drained members of this association usually have a Bf horizon that just meets the thickness and chemical requirements for a podzol. However, they may be underlain by a Bfj horizon morphologically almost identical with the overlying Bf horizon. The poorly drained member usually does not meet the requirements of a podzolic soil.

Associated soil unit

Soils of Baie-du-Vin and Richibucto associations are commonly associated with Galloway soils (Fig. 10).

All three soil associations are developed on the same type of outwash sand over sandstone bedrock, and all occur mainly in the eastern coastal plain. The Baie-du-Vin soils have a sand layer only 20–50 cm deep, whereas the Galloway soils have 50–100 cm, and the Richibucto soils have over 100 cm.

Guimond River Association (GR)

Soil units: GR1, GR2 —dominantly Orthic Humo-Ferric Podzol
GR3, GR4, GR5 —dominantly Gleyed Humo-Ferric Podzol
GR6, GR7 —dominantly Orthic Gleysol

General

Although only a small area of this soil was found in this region (4659 ha, 1.11% of the map), Guimond River is an important soil association in this map area. The material is a fairly good source of gravel, which is rare in this region. The Guimond River association is found more often in the southwest section and along the east coast; smaller areas are also scattered throughout the area.

Guimond River soils are developed in well-sorted glaciofluvial material on a wide range of landforms from almost level outwash plains to hummocky kames. The parent material is gravelly and very gravelly sand, loose, acidic, and usually more than 2 m thick. The coarse fragments (40–80% rounded gravel) are dominated by Pennsylvanian sandstones with minor amounts of harder rocks such as granite, quartzite, and gneiss.

Guimond River soils are always associated with glaciofluvial features, such as outwash plain, esker, kame, and river terrace (beach ridge).

Associated soil unit

Guimond River soils are often mapped in association with soils of the Riverbank (Fig. 15) and Richibucto associations. Although they occupy similar landforms, Riverbank soils have little or no gravel and are usually more than 80% sand. Along the east coast, Guimond River is commonly associated with the Richibucto association, which is marine-influenced outwash sand with little or no coarse fragments.

The Gagetown association occupies similar landforms and has similar texture to the Guimond River association. However, Gagetown material is dominated by harder gravels of quartzite, granite, gneiss, and schist and is, therefore, a much better quality of gravel than Guimond River.

Harcourt Association (HT)

Soil units: HT2 —dominantly Podzolic Gray Luvisol
HT3, HT4, HT5 —dominantly Gleyed Podzolic Gray Luvisol
HT6, HT7, HT8 —dominantly Orthic Luvic Gleysol

General

Harcourt is a major soil association of this region (64 816 ha, 15.50% of the map area). Most of the Harcourt soils are found in the south central area, with smaller areas in the north central, southeast, and southwest parts of the survey area. With a few exceptions, the Harcourt soils are found at 40–140 m above sea level.

Harcourt soils are developed on undulating (commonly 2–5% slope) glacial tills consisting of thin ablation over lodgment material (Fig. 16). The ablation till is about 30–50 cm thick, fine loamy, friable, acidic, and has about 5–15% coarse fragments (mostly gravel with some cobbles). The underlying lodgment till is very dense, fine loamy, firm to very firm, acidic, and with about 10–25% coarse fragments (mostly cobbles and stones). The petrological sources of both the tills are Pennsylvanian sandstone, red shale, and

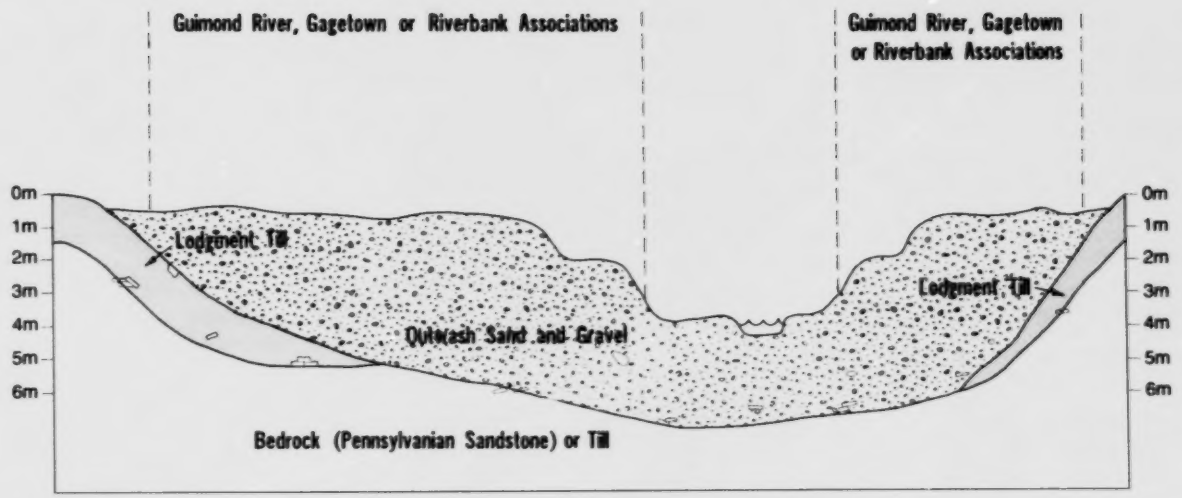


Fig. 15 Sketch of the landscape of the Gagetown, Guimond River, and Riverbank associations

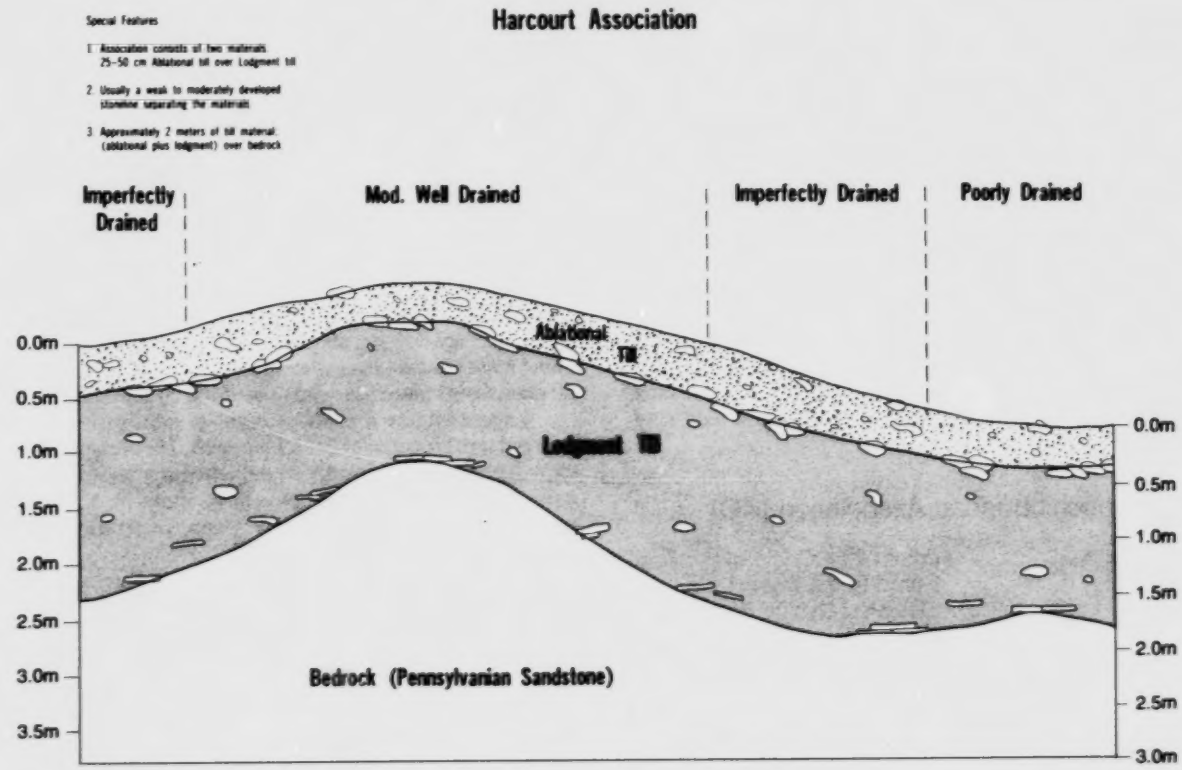


Fig. 16 Soilscape of the Harcourt association

some siltstone. A weakly developed stoneline between ablational and lodgment tills is common (Fig. 16). The total thickness of the two tills is usually 2 m or less.

Associated soil unit

The Harcourt association is commonly found in association with the Sunbury and Stonybrook association (Fig. 17).

The Sunbury association has ablation till more than 1 m thick and is coarser in texture. The Stonybrook association has very little or no ablation till on top of the lodgment till. Also, Sunbury soils usually have more surface stones and a more undulating surface.

Interval Association (IN)

Soil units: IN2 —dominantly Orthic Regosol
IN3, IN4, IN5—dominantly Gleyed Regosol
IN6, IN7, IN8—dominantly Rego Gleysol and Rego Humic Gleysol

General

Only minor areas of this association are found in this region (1918 ha, 0.46% of the map area). It is dominated by poorly and very poorly drained soil units, and therefore is of little agricultural significance. It can be found over a wide range of elevations.

Interval soils are found on young alluvial plains; they have little or no soil horizon development. The control section of Interval soils is coarse silty, acidic to neutral, friable, rich in organic carbon, and free from coarse fragments.

Interval soils are always associated with river terraces or floodplains, and therefore have high risk of flooding.

Associated soil unit

Soils of Riverbank, Gagetown, and Guimond River associations often occupy similar geographic positions (such as a river terrace) to Interval soils. However, Interval soils are distinguished by a lack of soil development and silty texture.

Kouchibouguac Association (KO)

Soil units: KO2 —dominantly Ortstein Humo-Ferric Podzol and Eluviated Dystric Brunisol
KO3, KO4, KO5 —dominantly Gleyed Ortstein Humo-Ferric Podzol
KO6, KO7, KO8 —dominantly Gleyed Ortstein Humo-Ferric Podzol

General

Only a small area has been mapped as the Kouchibouguac association (788 ha, 0.19% of the map area). The real area is considerably larger because many Kouchibouguac soils that were too small to delineate were mapped as inclusions of the Richibucto association. Almost all of them are found on the eastern half of the area and are below 40 m above sea level.

Kouchibouguac soils are developed on marine influenced glacial outwash sand. The parent material is acidic and loose, with small amounts (0–5%) of coarse fragments. Pennsylvanian sandstone bedrock is usually within 2 m of the soil surface. The first 50–100 cm of the bedrock is usually easily split, but it becomes harder with depth.

The outstanding feature of the Kouchibouguac soils is an ortstein horizon. An ortstein horizon is a Bh, Bhf, or Bf horizon at least 3 cm thick that is strongly cemented (by Al, Fe, or an organic complex) and occurs in at least one-third of the lateral extent of the pedon. The ortstein horizon is designated as Bhc, Bhfc, or Bfc, depending upon the organic C and extractable Fe contents. Ortstein horizons usually occur within 40 cm of the mineral soil surface; they are reddish brown to very dark reddish brown, very hard but moderately to slowly permeable, and not penetrated by roots. In the poorly drained members of the association, the ortstein becomes harder and almost covers the whole lateral extent of the pedon (Fig. 18).

Associated soil unit

Small areas of Kouchibouguac soils are often mapped as inclusions in the soils of the Richibucto and Galloway associations, which have similar parent materials but no ortstein horizons.

Lagacéville Association (LG)

Soil unit: LG —Terric Fibrisol with minor inclusions of Terric Humisol and Terric Mesisol, and always poorly drained

General

Lagacéville is a relatively minor organic soil mapping unit. There are 859 ha, about 0.21% of the survey area. It is found most often on the eastern coastal plain and the western till plain from almost sea level to over 100 m above sea level.

Lagacéville is a shallow organic soil, with mineral material (terric contact) 60–160 cm deep. The organic part of the soil profile is dominantly slightly decomposed sphagnum moss, with a rubbed fiber content of more than 40% by volume; it is extremely acid throughout the profile, with a bulk density of less than 0.1 g/cm^3.

The underlying mineral layer is usually strongly acid, and its texture is variable, generally similar to that of the surrounding mineral soils.

Lagacéville soils are closely associated with domed bogs, but the bogs are smaller and much shallower than those associated with Lavillette soil. Because of their shallowness, the organic material in the smaller bogs are much younger than the large deep bogs on a comparable location (or climate). Lagacéville is also mapped on the rim of some large bogs.

Associated soil unit

Lagacéville is most often associated with Lavillette soil, which is very similar in texture and other soil chemical and physical properties except that there is no terric contact in Lavillette soil (Fig. 9).

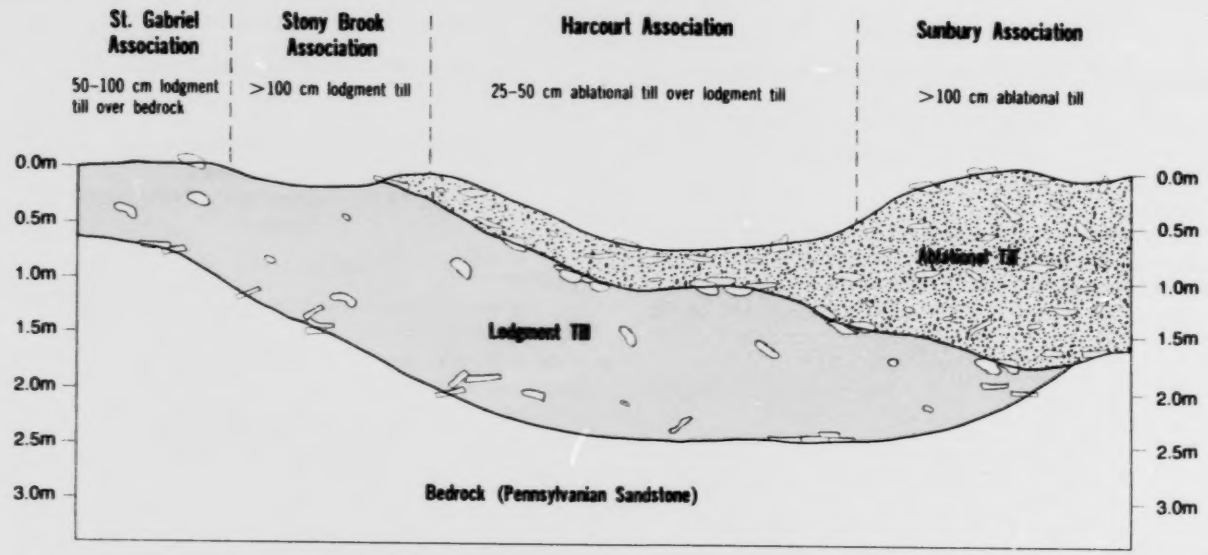


Fig. 17 Sketch of the landscape relationships among the Harcourt, Stony Brook, and Sunbury associations and associated soilscapes

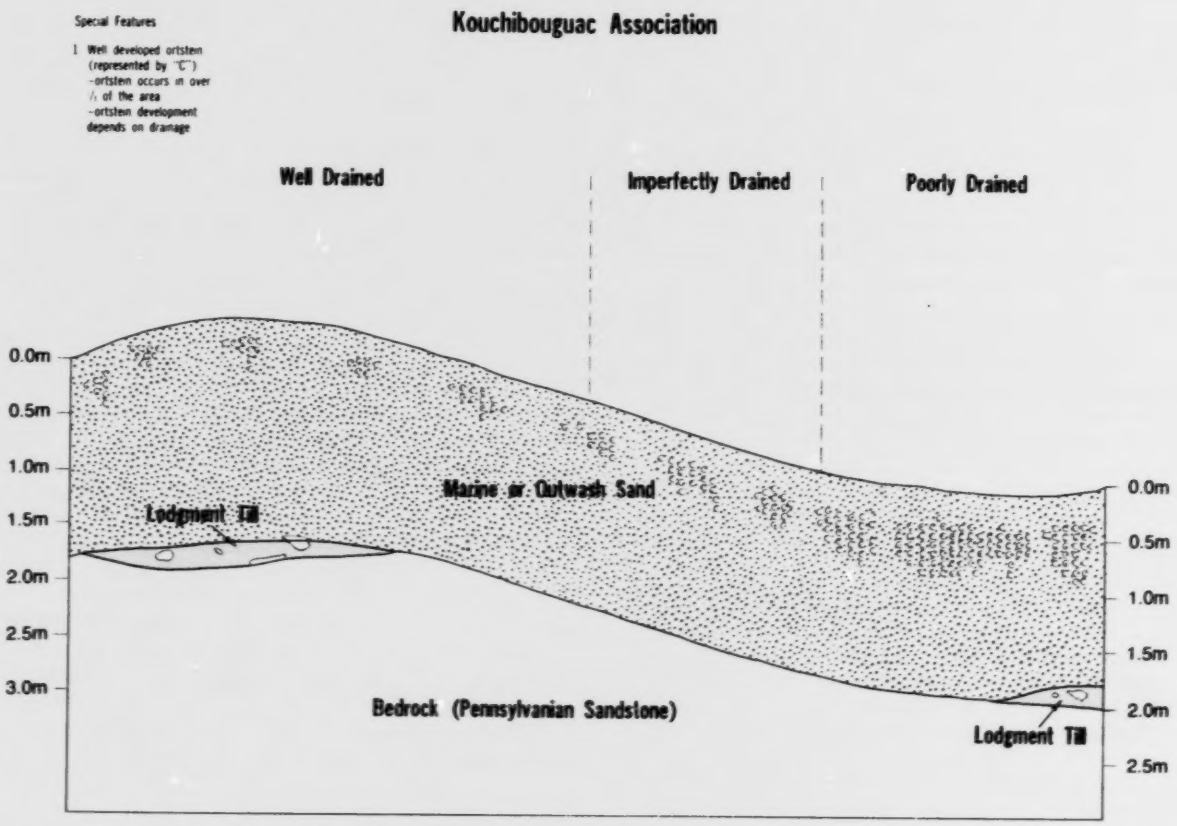


Fig. 18 Soilscape of the Kouchibouguac association

Lavillette Association (LV)

Soil unit: LV —dominantly Typic Fibrisol, with minor inclusions of Terric Fibrisol, Mesic Fibrisol, Typic Mesisol, and Fibric Mesisol, and always poorly drained

General

Lavillette is the most dominant and most commercially important organic soil of the survey area. There are 24 021 ha, about 5.36% of the map. It is found in large blocks of land usually on the eastern lowland and on the plateau of the western till plain. It was mapped from almost sea level to over 100 m above sea level.

The parent material of Lavillette soil is deep (about 5 m), slightly decomposed mosses, dominantly sphagnum spp., with some shrubs. The typical Lavillette association is found on domed bogs. As a result of climatic differences the bogs along the coast developed at a much faster rate than the ones further inland. For example, the bogs on the eastern coastal plain are 4000–7000 years old, whereas the bogs on the western till plain are about 10 000 years old; both are equally developed.

Lavillette soil is extremely acid and has more than 60% rubbed fiber by volume in all three tiers. Unless it has been cultivated, the bulk density of this soil is usually less than 0.1 g/cm^3.

Associated soil unit

Lavillette soils are most often associated with the Lagacéville soils in which the fibric organic material is similar, but shallow over mineral soil (a terric contact) (Fig. 9) at 60–160 cm deep.

In the eastern coastal plain some poorly drained soil units of Richibucto and Caraquet associations are also often associated with Lavillette soils.

Lord and Foy Association (LF)

Soil units: LF1, LF2 —dominantly Orthic Humo-Ferric Podzol

General

Only a minor area of Lord and Foy soils is found (202 ha, 0.04% of map area). They are usually associated with glaciofluvial features such as eskers and kames at all elevations in the region.

Lord and Foy soils are developed on well-sorted outwash materials of gravel and cobbles. The parent materials are fragmental, acidic, loose, and almost all of the coarse fragments are rounded Pennsylvanian sandstones. The gravel and cobbles are usually more than several metres thick. These soils are well or rapidly drained.

Associated soil units

Soils of the Gagetown, Guimond River, and Riverbank associations are formed on glaciofluvial materials and are therefore commonly found in association with Lord and Foy soils. It is easy to distinguish Lord and Foy from other soils by their content of gravel and cobbles; Gagetown and Guimond River are gravel and sands, Riverbank is mostly medium and fine sands.

Mount Hope Association (MH)

Soil units: MH2 —dominantly Podzolic Gray Luvisol
MH3, MH4, MH5 —dominantly Gleyed Podzolic Gray Luvisol
MH6, MH7 —dominantly Orthic Luvic Gleysol

General

The Mount Hope association is commonly found in the southeast of the surveyed area. There are 13 256 ha, 3.17% of the map area. This association is restricted to the eastern coastal plain, at less than 30 m above sea level.

Mount Hope soils are developed on firm, acidic, reddish clayey glacial marine deposits. They are found on many parts of the dissected eastern coastal plain and along tidal rivers on almost level to hummocky landforms (1–9% slope).

The parent material rarely contains coarse fragments, but occasional surface stones (gray sandstone) are not unusual. There is usually 30–35% clay in the parent material and usually more than 35% in the Bt horizon. The clay fraction is dominated by vermiculite in the topsoil and mica–illite in the subsoil.

Associated soil unit

Mount Hope is only one of the several soil associations found on the eastern coastal plain. Caraquet and Upper Caraquet soils (sand over marine clay) are often mapped in association with Mount Hope (Fig. 19). Other associations such as Richibucto, Galloway, and Baie-du-Vin soils (sand and sand over Pennsylvanian sandstone) are also common. Because the contrast of textures, particularly the surface textures, between Mount Hope and its commonly associated soils (such as Richibucto and Caraquet) are very strong, the boundary between the associations is usually abrupt.

Reece Association (RE)

Soil unit: RE2 —dominantly Fragic Humo-Ferric Podzol
RE3, RE4, RE5 —dominantly Gleyed Fragic Humo-Ferric Podzol
RE6, RE7 —dominantly Gleyed Fragic Humo-Ferric Podzol

General

Reece is one of the major soil associations of the surveyed area (62 458 ha, 14.95% of the area). It has been found on every section of the surveyed area with the exception of the eastern coastal plain. However, it is most commonly found on the central and southwestern part of the survey area. Reece soils usually occur at 40–140 m above sea level.

Reece soils are developed on undulating (commonly 2–5% slope) glacial tills, consisting of thin ablation over lodgment material. The overlying ablation till is about 40–50 cm thick, coarse loamy, friable, acidic, and with about 10% coarse fragments (mostly gravel with some cobbles). The underlying lodgment till is fine loamy, dense, firm,

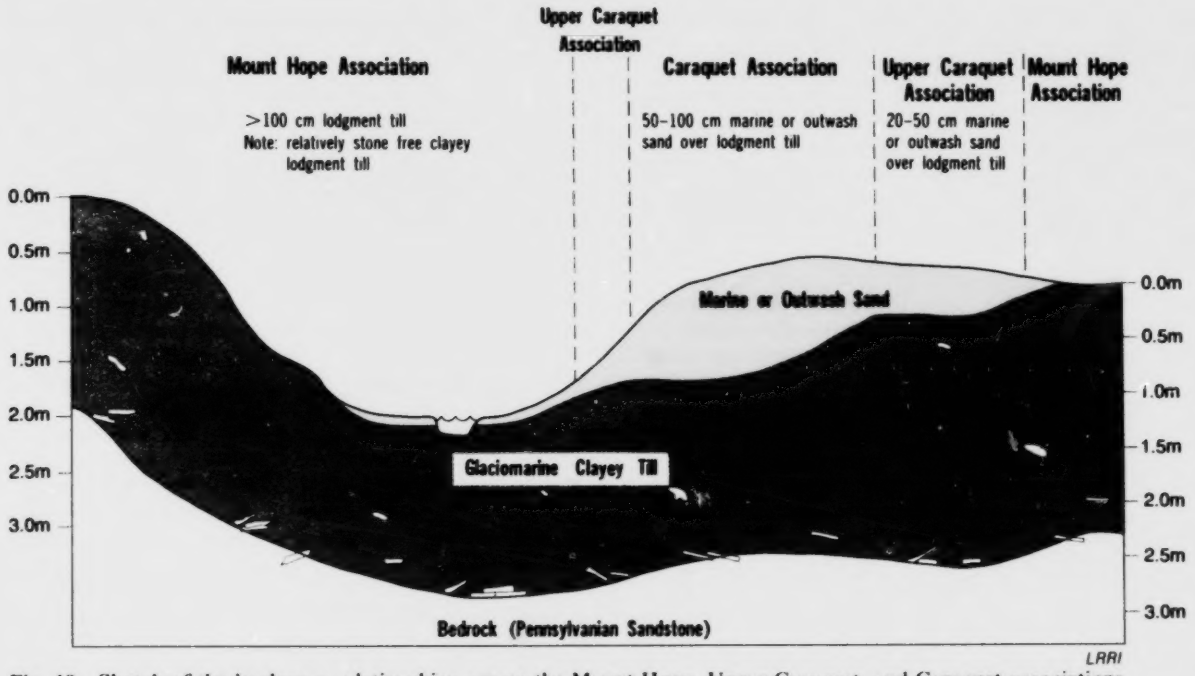


Fig. 19 Sketch of the landscape relationships among the Mount Hope, Upper Caraquet, and Caraquet associations

acidic, and with about 15% coarse fragments (mostly cobbles). The petrological sources of both tills are Pennsylvanian sandstone and siltstone. In moderately well-drained or imperfectly drained soil units, Reece commonly has a moderately developed fragipan about 40–60 cm below the surface (Fig. 20). The fragipan becomes weaker as the drainage becomes either better or worse than moderately well-drained to imperfectly drained. The total depth of the two tills is about 2 or 3 m over bedrock.

Associated soil unit

Reece soils are commonly associated with the Rogersville and Sunbury (Fig. 21) associations. They occupy similar landform (undulating ground moraine). However, the Rogersville soils have no thin ablation till on top and have a more compact subsoil than Reece soils. Rogersville soils have a weak Bt horizon as well as a fragipan. Reece soils have no Bt horizon but do have a fragipan. Sunbury soils have a coarser texture and no fragipan.

On a given landscape position, Reece soils are usually better drained than Rogersville soils.

Richibucto Association (RB)

Soil units: RB1, RB2 —dominantly Orthic Humo-Ferric Podzol

RB3, RB4, RB5 —dominantly Gleyed Humo-Ferric Podzol

RB6, RB7, RB8 —dominantly Gleyed Eluviated Dystric Brunisol

General

Richibucto association is most commonly found on the eastern coastal plain in the eastern part of the survey area. There are 18 816 ha, about 4.50% of the map. Almost all the Richibucto soils are located at less than 50 m above sea level.

The parent material of Richibucto soils is well-sorted marine-influenced outwash sand, more than 1 m deep. These soils almost always occur on the nearly level (0.5–2% slope) eastern coastal plain. The outwash sand is acidic and rich in biotite. It is free of coarse fragments, but sometimes it has some gravel or cobbles of Pennsylvanian sandstone origin.

The well-drained and imperfectly drained members of this association usually have a Bf horizon that just meets the thickness and chemical requirements for a podzol. However, they may be underlain by a Bfj horizon morphologically almost identical with the overlying Bf horizon. The poorly drained member usually does not meet the requirements of a podzolic soil.

Associated soil unit

Richibucto soils are most commonly associated with soils of the Baie-du-Vin and Galloway associations (Fig. 10).

All three soil associations are developed on the same type of outwash sand and are found on the eastern coastal plain. Baie-du-Vin soils have only 20–50 cm of outwash sand over sandstone bedrock, whereas Galloway soils have 50–100 cm. Richibucto has more than 100 cm of outwash sand over bedrock, and in some places, till.

Also commonly associated with the Richibucto association are the Barrieau and Buctouche (Fig. 11) and the Caraquet and Upper Caraquet (Fig. 13) associations.

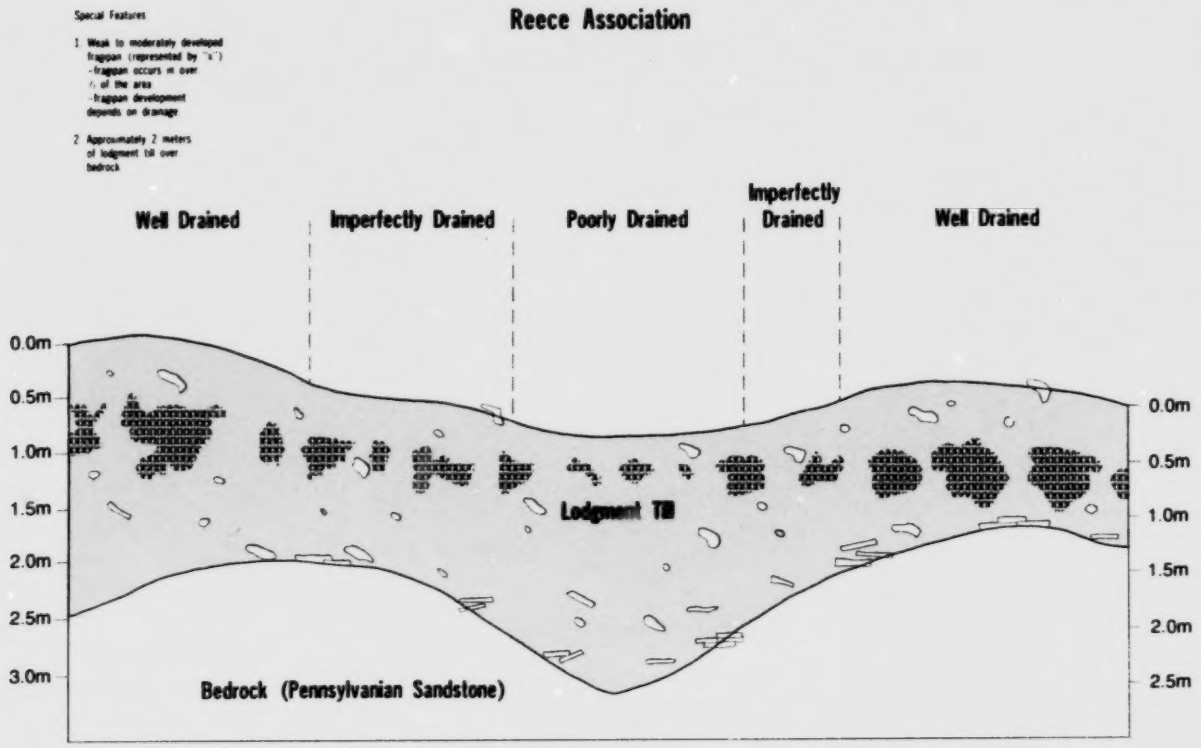


Fig. 20 Soilscape of the Reece association

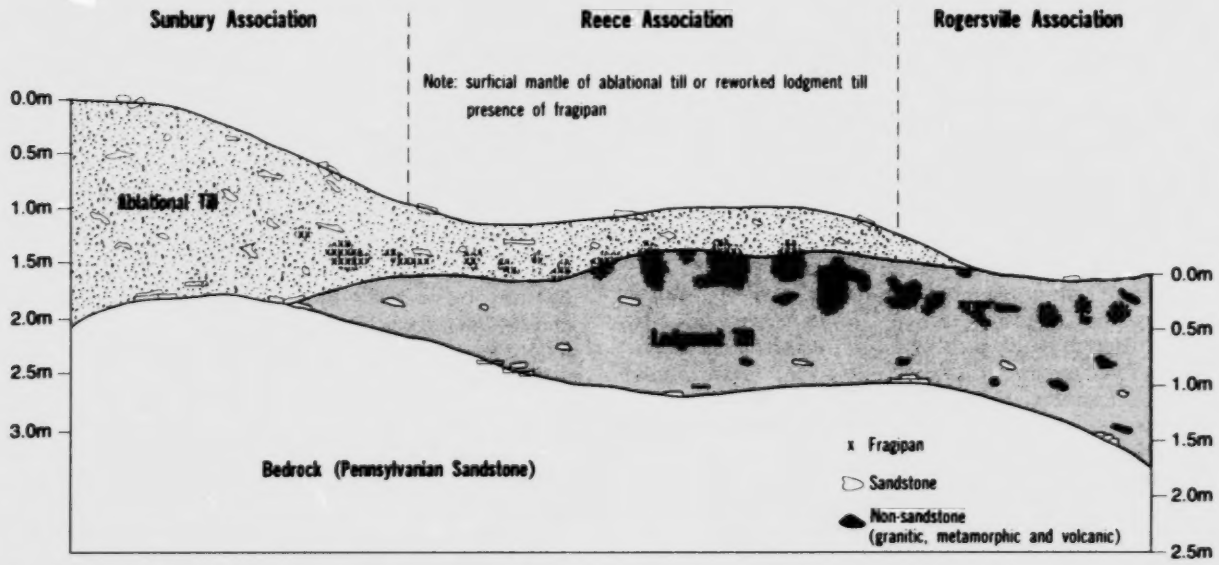


Fig. 21 Sketch of the landscape relationships among the Reece, Rogersville, and Sunbury associations

Riverbank Association (R)

Soil units: R1, R2 —dominantly Orthic Humo-Ferric Podzol
R3, R4, R5 —dominantly Gleyed Humo-Ferric Podzol
R6, R7 —dominantly Gleyed Eluviated Dystric Brunisol

General

Although covering a relatively small area (2977 ha, 0.71% of the survey area), Riverbank soils are widely scattered over the map area, except for the eastern coastal plain. Typically, Riverbank soils are found along the river valleys or associated with glaciofluvial features such as kames and eskers.

Riverbank soils are developed from more than 1 m of well-sorted glaciofluvial acidic sand (mostly fine and medium size). The sand fraction usually has a wide variety of minerals such as quartz, hornblende, biotite, and various feldspars. It is usually free of coarse fragments, but in places may contain as much as 20% by volume of gravel and cobbles.

The well-drained and imperfectly drained members of this association usually have a Bf horizon that just meets the requirements for a podzol. However, the poorly drained members usually do not meet the requirements.

Associated soil unit

Riverbank soils have been found associated with many other soils, but usually with soils developed from glaciofluvial material such as Gagetown and Guimond River associations (Fig. 15). These two soils, although also well sorted, are dominantly gravel.

Richibucto soils are very similar to Riverbank soils; both develop on well-sorted sand and are similar in texture. However, unlike Riverbank soils, Richibucto sand has a more limited variety of minerals that are closely related to the composition of the biotite-rich Pennsylvanian sandstone. Moreover, Richibucto soil is restricted to the eastern coastal plain.

Rogersville Association (RS)

Soil units: RS2 —dominantly Humo-Ferric Podzol and Fragic Humo-Ferric Podzol
RS3, RS4, RS5 —dominantly Gleyed Podzolic Gray Luvisol
RS6, RS7 —dominantly Orthic Luvic Gleysol and Fragic Luvic Gleysol

General

The Rogersville association is most commonly found in the west central and northwest parts of the survey area. There are 27 488 ha, 6.58% of the map area. Almost all the Rogersville soils are found at 40–100 m above sea level.

Rogersville soils are developed on undulating glacial till plain. The till, usually 1–3 m thick, is fine loamy, acidic, compact, and with 5–25% coarse fragments by volume (mostly gravel and cobbles with a few stones). The coarse fragments are quartzite, gneiss, granite, volcanic, argilite, and some sandstone.

In about 40% of the soils, a weakly to moderately developed fragipan is located at about 40–60 cm below the surface (Fig. 22). The pan is undetectable when wet, but it becomes hard and brittle when dry or moist. Also, Rogersville soil often has a weak Bt horizon, especially when drainage is poor.

Associated soil unit

Rogersville soil is most often associated with soils of the Reece association (Fig. 21), both commonly found on undulating till plain. The main difference is the petrological compositions of the till. Reece soils are derived from sandstone and have a slightly coarser texture than Rogersville soils. Rock fragments in Rogersville soils are mostly of metamorphic, granitic, and volcanic origin. Other soil characteristics such as Bt horizon, fragipan, and permeability also are different. A weak Bt is often present in Rogersville soils, but rare in Reece soils. However, fragipan is very common in Reece, but less common in Rogersville soils. Both Reece and Rogersville soils are considered to be very slowly permeable, but Reece soils are the more permeable of the two.

St. Gabriel Association (SG)

Soil units: SG2 —dominantly Humo-Ferric Podzol
SG3, SG4, SG5 —dominantly Gleyed Humo-Ferric Podzol
SG6, SG7, SG8 —dominantly Gleyed Humo-Ferric Podzol

General

The St. Gabriel association is a relatively minor association, mostly found in southern parts of the survey area, but with scattered areas elsewhere. There are 6129 ha, 1.47% of the map area. It is usually found at 40–140 m above sea level.

St. Gabriel soils usually occur in thin till over Pennsylvanian sandstone bedrock and are classified as shallow lithic. They are almost always associated with undulating terrain (2–5% slope). The shallow till layer (50–100 cm) is fine loamy, acidic, and contains 5–25% coarse fragments by volume, mostly sandstones of cobble and stone size.

Although the surface layers (A and Bf horizons) are friable and have good soil structure, the subsoils 30–40 cm below the mineral soil surface are usually very dense and compact and have poor soil structure.

Associated soil unit

St. Gabriel soils are the shallow lithic phase of the Harcourt and Stonybrook associations (Fig. 17), with which they are associated where the undulating ground moraine thins out to a veneer.

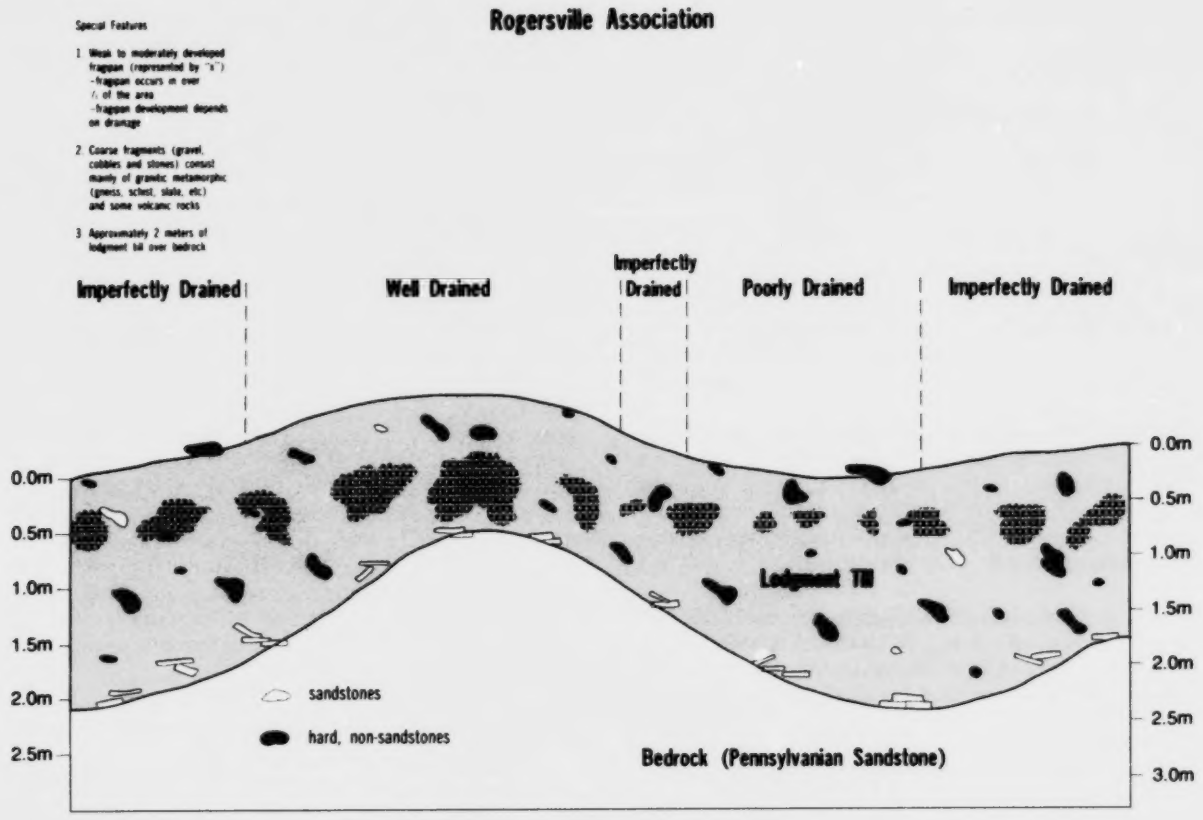


Fig. 22 Soilscape of the Rogersville association

Stony Brook Association (SB)

Soil units: SB2 —dominantly Podzolic Gray Luvisol

SB3, SB4, SB5 —dominantly Gleyed Podzolic Gray Luvisol

SB6, SB7, SB8 —dominantly Orthic Luvic Gleysol

General

Stony Brook is a common soil association of this region and is found mostly in the central and southeastern part of the survey area. There are 20 201 ha, about 4.83% of the map area. It is usually found at 40–120 m above sea leavel.

Stony Brook soils are developed on a blanket, 1–2 m thick, of lodgment till on undulating terrain. The lodgment till is fine loamy, acidic, with 5–25% coarse fragments of mostly sandstone and some soft red shale. The underlying bedrock is easily split Pennsylvanian sandstone.

The A and Bf horizons of the Stony Brook soils are friable and have good soil structure, but the Bt and C horizons are usually compact and very slowly permeable.

Associated soil unit

Stony Brook soils are commonly associated with soils of the Harcourt association, and to a lesser degree with soils of the St. Gabriel association (Fig. 17).

The upper 30–40 cm of soil of the Harcourt association is ablation till, and there usually is a weak stoneline between the ablation till and the underlying lodgment till. St. Gabriel soils are the shallow lithic phase of Stony Brook soils.

Sunbury Association (S)

Soil units: S1, S2 —dominantly Orthic Humo-Ferric Podzol

S3, S4, S5 —dominantly Gleyed Humo-Ferric Podzol

S6, S7 —dominantly Gleyed Humo-Ferric Podzol

General

Sunbury soils are commonly found in the southwest of the survey area, although smaller delineations were often mapped in other parts of the map area, except on the eastern coastal plain. There are 24 462 ha, about 5.86% of the map

area. Most of the Sunbury soils are situated at 50–140 m above sea level.

Sunbury soils are developed on ablation till on strongly undulating landforms. The till is coarse loamy, acidic, friable, and rapidly permeable. The ablation till is commonly less than 2 m thick overlying easily split Pennsylvanian sandstone bedrock. Sunbury soils usually have significant amounts of surface stone (almost exclusively sandstone), and there are about 10–30% coarse fragments (dominantly cobble and stone size) in the control section. This association usually has strongly developed podzolic B horizons.

Associated soil unit

Sunbury is most often associated with the Big Hole, Fair Isle (Fig. 12), Harcourt (Fig. 17), and Reece (Fig. 21) associations. Big Hole is a very shallow lithic phase (20–50 cm of till over sandstone bedrock) of Sunbury soils. Fair Isle is a shallow lithic phase (50–100 cm of till over sandstone bedrock) of Sunbury soils. Harcourt is a finer textured soil than Sunbury and has a very compact subsoil. Harcourt soils also have much less surface stone. On similar undulating till plain, Sunbury soils are usually better drained than Harcourt soils. Reece soils, while similar in color to Sunbury soils, are easily distinguished from them by a finer texture, presence of a fragipan, a more compact subsoil, and fewer surface stones.

Tracadie Association (TD)

Soil units: TD3, TD4, TD5 —dominantly Gleyed Gray Luvisol

TD6, TD8 —dominantly Orthic Luvic Gleysol

General

Tracadie soils are a minor soil of this region, found mainly on the northeastern part of the survey area. There are 1191 ha, 0.29% of the map area. Almost all the Tracadie soils were mapped at less than 50 m above sea level.

Tracadie soils were developed on calcareous marine clay rich in mica–illite and chlorite, reddish in color, and free of coarse fragments. Although the parent material is neutral to strongly calcareous, the surface soil (Ae and upper B) is strongly acid. The Bt horizon is usually well developed, with common thick clay films, and is only slightly acid.

No well-drained Tracadie soils were mapped in the survey area.

Associated soil unit

Soils of Fundy and Upper Caraquet associations are often associated with Tracadie soils.

Fundy soils are similar in texture and landform to Tracadie soils, but they are yellowish brown and the parent material is only weakly calcareous or neutral. Upper Caraquet soils are the sandy phase of Fundy and Tracadie soils, with 20–50 cm of marine sand overlying the compact clayey marine deposit. The Bt horizon in Upper Caraquet soils is only weakly developed, and the well-drained soils have a podzolic B in the sand layer.

Upper Caraquet Association (UC)

Soil units: UC2 —dominantly Orthic Humo-Ferric Podzol

UC3, UC4, UC5 —dominantly Gleyed Humo-Ferric Podzol

UC6, UC7, UC8 —dominantly Orthic Gleysol

General

Upper Caraquet soils were found almost exclusively on the eastern coastal plain in the northeastern part of the survey area. There are 3642 ha, 0.85% of the map area. Almost all of the Upper Caraquet soils were mapped at less than 40 m above sea level.

This association is developed on two contrasting textured marine deposits: 20–50 cm of sand overlying compact marine clay. The sand is mostly fine, medium grade, and acidic, and contains 80–90% quartz, with some feldspars and micas (Hamilton and Sutherland 1968).[11] The underlying marine clay is usually more than 2 m thick, slightly acid in the upper part, and becoming calcareous or neutral deeper. The well-drained and imperfectly drained members of this association usually have a Bf horizon in the sandy layer that just meets the thickness and chemical requirements for a podzol. This horizon may be underlain by a Bfj horizon that is morphologically almost identical. The poorly drained member usually does not meet the requirements of a podzolic soil.

Associated soil unit

Soils of the Upper Caraquet association are usually associated with Fundy and Mount Hope soils (Figs. 13 and 19).

The Upper Caraquet association is a sandy phase of both Fundy and Mount Hope associations. The Fundy and Mount Hope soils have much better developed Bt horizons. Fundy soils lack the podzolic B horizon that is found in Mount Hope and Upper Caraquet soils. There are 20–50 cm of a marine sandy layer on top of the clayey marine or lacustrine materials in the Upper Caraquet association.

[11]Hamilton, J. B.; Sutherland, J. K. Silica in New Brunswick. New Brunswick Department of Natural Resources; 1968.

Degree and kind of limitations affecting farmland, community development, and recreation uses

The soils are evaluated and placed into interpretive groupings, which are expressed in terms of degree of limitation. The interpretations apply to the soils as they are found in their natural states.

Four degrees of soil limitations are used:

Slight—The soil is relatively free of problems or the limitations can be easily overcome.

Moderate—Limitations exist, but they can be overcome with good management and careful design. Input costs should be carefully assessed.

Severe—Limitations are severe enough to make use questionable, because of costs of overcoming them or of continuing problems expected with such use. Severe does not mean that the soil must be excluded from a particular use, but it indicates the difficulty of attempting to put the soil to that use.

Unsuitable—Although modern equipment and knowledge make it possible to overcome most limitations, this limitation means that the input required to utilize soils rated as unsuitable is too great to justify the effort under existing conditions.

Various soil properties are evaluated in establishing the degrees and kinds of limitations for the following uses: field crops, vegetable crops, septic tank systems, housing, sanitary landfills, local roads and streets, athletic fields, and outdoor living. With these interpretations, it is possible to select from a soils map those areas that have the least limitations for each of the above uses. Allowance also must be made for the scale of the map, which prevents areas smaller than about 25 ha to be shown. However, the soils in these small areas can often be identified from the descriptions in Chapter 3 of soils associated with those shown for any particular area on the map.

These ratings are based only on soil and landscape criteria. The soil rating indicates the severity of the limitation if the soil is used without corrective or precautionary measures. Socioeconomic factors are ignored. The size, shape, and location of a soil area are not taken into consideration when it is evaluated for a particular use.

Use of the soil limitation tables

The degree of limitation (slight to none, moderate, severe, or unsuitable) is determined by the most restrictive or severe rating assigned to any of the listed soil properties. For example: If the degree of limitation is "slight to none" for all but one soil property, and its degree of limitation is "severe," then the overall rating of the soil for that given use is "severe." However, the degree of limitation of the individual soil properties can have a cumulative effect. This applies only to limitation ratings of "moderate" and "severe." If the most severe rating of all the soil properties is "moderate," but several properties are rated as such, then the overall rating for the soil can be downgraded to "severe." The same applies to downgrading "severe" to "unsuitable." The requirements for downgrading a soil's degree of limitation are arbitrary. The severity of the combined effects of several limiting factors will determine whether downgrading is warranted. This is left up to the discretion of the interpreter.

Caution: It is incorrect to assume that each of the major soil properties influencing use has an equal effect. Class limits for the degree of limitation of individual soil properties were established taking this into account and thus, in fact, weighing each property separately.

Soil limitations for agriculture

Soil interpretations for agriculture have been divided into field crops and vegetable crops. Soil limitation guides have been established for each separately. No ratings were established for pasture lands.

The soil capability classification for agriculture in the interpretation sheets are based on *Soil capability classification for agriculture*, The Canada Land Inventory Report No. 2, 1965; Queen's Printer, Ottawa.

In the Canada Land Inventory (CLI) system, Class 6 land is for land that has sustained natural grazing capacity. In the surveyed area, there is no Class 6 land.

Field crops

The degree of limitation for field crops is based on the CLI report *Soil capability classification for agriculture*. The limitation ratings are as follows:

Slight—Capability Class 2

Moderate—Capability Class 3

Severe—Capability Class 4

Owing to climatic limitations in the Maritime region, no soils are classified as having an agricultural capability of Class 1; the best agricultural land is Class 2. Mineral soils in Classes 2, 3, and 4 are considered capable of sustained use for cultivated field crops.

The soil properties used in the ratings are based on the limitations recognized at the capability subclass level. Range limits are set accordingly. This results in a very general scheme in which a soil is rated for the average field crop.

These interpretive soil limitation classes are not applied to organic soils, because, in general, there is insufficient information on these organic soil areas to make such an interpretive judgment.

See Table 2 for criteria used in rating soils for field crops.

Vegetable crops

Because of the variability in soil requirements of vegetable crops, the rating of soils for such production can only be generalized. Soils rated as having slight to no limitation are suited to a wide variety of vegetable crops. Production for early markets is not used as a rating criteria. On the average, vegetable crops are more demanding of soil qualities than are field crops and so a soil's degree of limitation tends to be more severe, or at least as severe, for vegetable crop production as it is for field crop production. This relationship was considered when class limits were established. The soil criteria used in "Soil limitations for field

Table 2. Soil limitations for field crops[1]

Major soil properties influencing uses	Degree of limitation		
	Slight to none	Moderate	Severe
Depth to compact layer	greater than 0.75 m	0.75–0.40 m	less than 0.40 m
Permeability (at 50 cm deep)	greater than 0.5 cm/hr (moderately slow or faster)	less than 0.5 cm/hr, greater than 0.1 cm/hr (very slow)	less than 0.1 cm/hr (extremely slow)
Actual erosion	moderate	moderately severe	severe
Fertility	soils highly responsive to fertilizer	soils moderately responsive to fertilizer	cannot be improved with feasible management
Flooding	occasional flooding, no crop damage	frequent flooding, some crop damage	frequent flooding, severe crop damage
Available moisture[2]	not affected by droughtiness (greater than 9 cm of available moisture)	moderately affected by droughtiness (9–5 cm of available moisture)	moderately severe or severely affected by droughtiness (less than 5 cm of available moisture)
Surface stoniness	S0, S1, S2 (stones 2–10 m apart and greater)	S3 (stones 0.5–2 m apart)	S4 (stones 0.1–0.5 m)
Depth to bedrock	greater than 1.0 m	1.0–0.5 m	less than 0.5 m, greater than 0.2 m
Topography	0–5%	5–9%	9–15%
Excess water	rapidly, well, and moderately well drained	imperfectly drained	poorly drained

A fourth degree of soil limitation is also defined for Field Crops:
Unsuitable: flooding throughout most of growing season
stoniness S5 (stones less than 0.1 m apart)
less than 0.2 m to bedrock
slopes greater than 15%
CLI Capability Classes 6 and 7 and part of 5
soils with very poor drainage

[1]Based on *Soil capability classification for agriculture*. The Canada Land Inventory Report No. 2, 1965 and Rose, R. D. et al. *Use of soils in the fourteen-county Appalachia region of New York State*. Agronomy Mimeo. 69–5; 1969. Dept. of Agronomy, Cornell Univ.
NOTE: Crops that create conditions that are favorable for soil erosion (e.g., row crops such as corn) should be rated according to the Soil Limitations for Vegetable Crops Classes.
[2]Class limits are based on the amount of moisture in the surface 50 cm of soil. The class storage capacities are related to rainfall and evapotranspiration rates and plant requirements.

crops" are used to rate soils for vegetable crops, but the ratings are more restrictive. Also, some additional soil properties considered to be of significant importance in vegetable production are included.

These interpretive soil limitation classes are not applied to organic soils, because, in general, there is insufficient information on these organic soil areas to make such an interpretive judgment. Some experimentation has been carried on within the survey area (at the experimental peat bog, Saint-Charles); however, various production and management problems have arisen.

These limitations deal with the soil's ability to produce vegetable crops on a viable commercial basis. Home gardening is a different matter. Family gardens are relatively small in size, receive more intensive soil manipulation, and most important, are not governed by the "produce or else" aspect of business. Although the interpretations for vegetable crops can be used as a guide to locate soil units most suitable for home gardens, remember that relatively suitable plots can usually be found or established within the boundaries of even the poorer grade soils.

See Table 3 for criteria used in rating soils for vegetable crops.

Soil limitations for septic tank absorption fields

A septic tank absorption field is designed to dispose of effluent or sewage by soil absorption. The effluent from the septic tank is distributed as uniformly as possible throughout the natural soil medium by means of a subsurface tile system. The soils are rated according to their abilities to absorb and filter this effluent. The major soil properties affecting the movement of effluent from a septic tank are the permeability of the soil at and below the depth of the tile line and the slope. Other criteria used for rating the soils are related to either the construction and maintenance or the prevention of con-

Table 3. Soil limitations for vegetable crops[1]

Major Soil Properties influencing uses	Degree of limitation		
	Slight to none	Moderate	Severe
Depth to compact layer	greater than 1.0 m	1.0–0.5 m	less than 0.5 m greater than 0.3 m
Permeability (subsoil)	greater than 0.5 cm/hr (faster than slow)	less than 0.5 cm/hr, greater than 0.1 cm/hr (very slow)	less than 0.1 cm/hr (extremely slow)
Actual erosion	moderate	moderately severe	severe
Fertility	soils highly responsive to fertilizer	soils moderately responsive to fertilizer	cannot be improved with feasible management
Flooding	occasional flooding	frequent flooding, some crop damage	frequent flooding, severe crop damage
Available moisture[2]	no need for irrigation (greater than 10 cm of available moisture)	may need irrigation in some years (10–6 cm of available moisture)	irrigation is necessary for successful crops (less than 6 cm of available moisture)
Surface coarse fragments			
gravel	less than 5%	5–35%	35–50%
cobbles	less than 2%	2–15%	15–30%
stones	S0, S1 (stones 10–30 m apart and greater)	S2 (stones 2–10 m apart)	S3 (stones 0.5–2 m apart)
Depth to bedrock	greater than 1.0 m	1.0–0.5 m	less than 0.5 m greater than 0.3 m
Topography	0–2%	2–5%	5–12%
Excess water	well and moderately well drained	rapidly and imperfectly drained	poorly drained
Surface texture	loam, silt loam, sandy loam	loamy sand	silty clay, clay, clay loam, silty clay loam, sandy clay loam, sand

A fourth degree of soil limitation is also defined for vegetable crops:
Unsuitable: less than 0.3 m to compact layer
flood risk throughout much of growing season
greater than 50% gravel in surface layer
greater than 30% cobbles in surface layer
stoniness S4 and S5 (stones 0.1–0.5 m)
less than slopes greater than 9%
soils with very poor drainage
severe droughtiness

[1]Based on *Soil capability classification for agriculture*. The Canada Land Inventory Report No. 2, 1965 and Rose, R. D., et al. *Use of soils in the fourteen-county Appalachia region of New York State*. Agronomy Mimeo. 69–5; 1969. Dept. of Agronomy, Cornell Univ.
[2]Class limits are based on the amount of moisture in the surface 50 cm of soil. The class storage capacities are related to rainfall and evapotranspiration rates and plant requirements.

tamination of water supplies, streams, rivers, and lakes. These criteria are permeability, depth to seasonal high groundwater table (either continuous or perched), depth to bedrock, slope, flooding hazard, and stoniness.

See Table 4 for criteria used in rating soils for septic tanks.

Soil limitations for housing

The soil limitation ratings for housing are for homes (single-family dwellings) and other structures (buildings of three stories or fewer) with similar foundation requirements. The soils are rated for buildings with and without basements. Basements are considered to be at least 1.5 m deep. Standard construction practices are assumed, such as dampproofing and installation of foundation drains. The emphasis in rating soils for housing is placed on the properties that affect suitability for foundations. Properties influencing the ease or difficulty of excavation and construction are evaluated for both the building and the installation of utility lines. Excluded from soil limitation ratings for housing are soil suitability for septic tanks and access roads, water supply potential, and factors of location desirability. These are general ratings. It is important to note that on-site investigations are necessary for specific placement of buildings and utility lines and for detailed design of foundations.

Table 4. Soil limitations for septic tanks[1]

Major Soil Properties influencing uses	Degree of limitation		
	Slight to none	Moderate	Severe
Permeability[2] (subsoil)	greater than 2.0 cm/hr *but* less than 12 cm/hr[3]	2.0–0.5 cm/hr	less than 0.5 cm/hr or greater than 12 cm/hr[3]
Depth to seasonal high groundwater table[4]	greater than 1.5 m (rapidly drained)	1.5–0.5 m (well and moderately well drained)	less than 0.5 m (imperfectly and poorly drained)
Depth to bedrock[5]	greater than 1.5 m	1.5–1 m	less than 1 m
Slope[6]	less than 9% (a,b,c,d)	9–15% (e)	15–30% (f)
Flooding hazard	not subject to flooding	this rating not used	subject to flooding (flooding once in 5 years or less frequently)
Surface stoniness[6, 7]	S0, S1, S2 (stones 2–10 m apart and greater)	S3 (stones 0.5–2 m apart)	S4, S5 (stones 0.1–0.5 m apart or less)

A fourth degree of soil limitation is also defined for septic tanks:

Unsuitable: slopes greater than 30%
permeability greater than 25 cm/hr
flooding more than once in 5 years
depth to bedrock less than 50 cm
organic soils
permanently wet

[1]Limitation based on Rose, R. D., et al. *Use of soils in the fourteen-county Appalachia region of New York State*. Agronomy Mimeo. 69–5; 1969. Dept. of Agronomy, Cornell Univ. USDA Soil Conservation Service. *Guide for interpreting engineering uses of soils*. Soils Memorandum SCS-45 (Rev. 2); Holland, W. D. and Coen, G. M.: *Soils of Waterton Lakes National Park, Alberta*. Alberta Institute of Pedology, Information Report NOR-X-65; 1976.
[2]This rating refers to the permeability (as determined by the constant head method using core samples of the subsoil at and below the depth of the tile line).
[3]Soils with permeability rates greater than 12 cm/hr are considered possible groundwater pollution hazards.
[4]The depth to the seasonal high water table should be at least 1.0 m below the depth of the tile (which is assumed to be at a depth of at least 0.5 m). While the presence of a high groundwater table level, either continuous (true) or perched, is a serious problem to the functional operation of a septic tank, the continuous water table also presents the hazards of polluting the groundwater. Perched water tables do not pose this problem and can be rated more leniently.
[5]The bedrock, an easily split Pennsylvanian sandstone in this area, tends to be readily permeable in the upper 0.5-1 m but is very slowly permeable below.
[6]Class definitions: Canada Soil Survey Committee, Subcommittee on Soil Classification. *The Canadian system of soil classification*. Can. Dep. Agric. Publ. 1646. 1978; Ottawa, Ont.: Supply and Services Canada; 164 p.
[7]In this area the surface stones tend to be relatively small in size (less than 50 cm). They are easily moved with light equipment and pose a less severe limitation than do an equal amount of large stones.

The features that affect the rating of a soil for dwellings are classed as those related to capacity to support load and to resist settlement under load and those that relate to ease of excavation. Soil properties that affect capacity to support load are wetness (depth to seasonal high water table), flooding, plasticity, and texture (as indicated by the Unified Soil Classification System[12] rating), shrink-swell potential, and potential frost action. Those that affect excavation are wetness, slope, depth to bedrock, and surface stoniness.

See Table 5 for criteria used in rating soils for housing.

Soil limitations for area-type sanitary landfill

Because a sanitary landfill is a waste disposal area, it should be operated in such a way as to minimize its offensiveness (i.e., smoke, odor, appearance, pollution hazard, and so on). Soil is used as the covering and sanitizing material. In the area-type sanitary landfill, successive deposits of refuse are each covered by about 15 cm of soil until several successive layers of waste and soil are built up to the ultimate thickness. Then a final cover of about 50 cm of soil is placed over the fill. The soil used for covering is either the material left over from preparing the landfill area (stripping) or it can be hauled in.

The features considered in rating the soils are predominantly associated with potential pollution hazard. Thorough evaluation of site hydrology is essential beforehand, because if pollution problems arise, it is not practical to remove the refuse owing to the size and character of the landfill, but it may be possible to install barriers (berms). A seasonal high water table may be controlled by a perimeter drain.

Because landfill areas are subject to heavy vehicular traffic, soil properties that affect trafficability are also of great importance.

See Table 6 for criteria used in rating soils for area-type sanitary landfill.

[12]Soil manual for design of asphalt pavement structures. College Park, Maryland: The Asphalt Institute; 1969.

Table 5. Soil limitations for housing[1]

Major Soil Properties influencing uses	Degree of limitation		
	Slight to none	Moderate	Severe
Depth to seasonal high water table			
with basement	greater than 1.2 m (well and rapidly drained)[2]	1.2–0.5 m (moderately well drained)	less than 0.5 m (imperfectly and poorly drained)
without basement	greater than 0.5 m (rapidly, well, and moderately well drained)	0.5–0.2 m (imperfectly drained)	less than 0.2 m (poorly drained)
Slope[2]	0–9% (a,b,c,d)	9–15% (e)	15–30% (f)
Depth to bedrock[3]			
with basement	greater than 1 m	less than 1 m	this rating not used
without basement	greater than 0.5 m	less than 0.5 m	this rating not used
Flood hazard	no flooding	no flooding	subject to flooding (floods once in 20 years or less frequently)
Unified soil group[4]	GW, GP, SW, SP, GM, GC, SM, SC, CL (PI[5], less than 15)	ML, CL (PI[5], greater than 15)	CH, MH, OL, OH
Potential frost action[6]	low	moderate	high
well & imperfectly drained	GW, GP, SW, SP	GM, GC, SM, CL, SC	ML, MH
poorly drained	GW, GP	SW, SP, GC, CL	GM, SM, SC, ML, MH
Surface stoniness[2,7]	S0, S1, S2 (stones 2–10 m apart and greater)	S3 (stones 0.5–2 m apart)	S4, S5 (stones 0.1–0.5 m apart and less)
Shrink-swell potential[8]	Except for the Fundy (FU), Tracadie (TD), and Mount Hope (MH) associations, which have a moderate shrink-swell potential, this factor is of slight to no limitation for soils in the survey area.		

A fourth degree of soil limitation is also defined for housing:

Unsuitable: slopes greater than 30%
permanently wet soils
flooding more than once in 20 years
organic soils

[1]Limitation based on Rose, R. D., et al. *Use of soils in the fourteen-county Appalachia region of New York State*. Agronomy Mimeo, 69–5; 1969. Dept. of Agronomy, Cornell Univ.; USDA Soil Conservation Service. *Guide for interpreting engineering uses of soils*. Soils Memorandum SCS–45 rev. 2, 1971; and Coen, G. M.; Holland, W. D. *Soils of Waterton Lakes National Park, Alberta*. Alberta Institute of Pedology, Information Report NOR-X-65; 1976.

[2]Class definitions from Canada Soil Survey Committee, Subcommittee on Soil Classification. *The Canadian system of soil classification*. Can. Dep. Agric. Publ. 1646. Ottawa, Ont.: 1978; Supply and Services Canada; 164 p.

[3]Because the bedrock throughout the survey area is a soft, easily split Pennsylvanian sandstone, it has only a moderate influence on excavation and construction costs for buildings or for installation of utility lines. Where it is very easily split the influence is slight to none.

[4]This item estimates the soil's ability to withstand applied loads.

[5]PI means plasticity index.

[6]Potential frost action is based on the *USDA Soil Conservation Service. Guide for interpreting engineering uses of soils*. Soils Memorandum SCS-45 rev. ed., 1976. However, it has been slightly modified. Proper house construction should include preventative measures to reduce or eliminate most frost heaving.

[7]In this area the surface stones tend to be relatively small in size (less than 50 cm), and thus are easily removed with light equipment when preparing the site. For this reason, stoniness is a less severe limitation than might be expected.

[8]The shrink-swell potential is based on plasticity index ranges as established by Coen, G. M.; Holland, W. D. *Soils of Waterton Lakes National Park, Alberta*. Alberta Institute of Pedology, Information Report NOR-X-65; 1976.

Table 6. Soil limitations for area-type sanitary landfill[1]

Major Soil Properties influencing uses	Degree of limitation		
	Slight to none	Moderate	Severe
Depth to seasonal high true groundwater table[2]	greater than 1.5 m (rapidly drained)[3]	1.5–1.0 m (well and moderately well drained)	less than 1.0 m (imperfect, poorly and very poorly drained)
Flooding	none	less than once in 50 years	more than once in 50 years
Permeability[4] (subsoil)	less than 5 cm/hr	this rating not used	more than 5 cm/hr
Slope[3]	0–9% (a,b,c,d)	9–15% (e)	15–25% (part of f)
Subsoil texture[3,5]	sandy loam, loam, silt loam, sandy clay loam	silty clay loam, clay loam, sandy clay, loamy sand	silty clay, clay, gravel, sand, organic
Depth to bedrock[6]	greater than 2.0 m	2.0–1.0 m	less than 1.0 m
Surface stoniness[3,7]	S0, S1, S2 (stones 2–10 m apart and greater)	S3 (stones 0.5–2 m apart)	S4, S5 (stones 0.1–0.5 m apart and less)

A fourth degree of soil limitation is also defined for area type sanitary landfill:

Unsuitable: depth to seasonal high water table less than
flood more than once in 10 years
permeability greater than 25 cm/hr
slope greater than 25%
depth to bedrock less than 0.5 m
organic soils

[1]Limitation based on Rose, R. D., et al. *Use of soils in the fourteen-county Appalachia region of New York State*. Agronomy Mimeo. 69–5; 1969. Dept. of Agronomy, Cornell Univ.; USDA Soil Conservation Service. *Guide for interpreting engineering uses of soils*. Soils Memorandum SCS–45 rev. 2, 1971.
[2]This refers to the true groundwater table, and associated drainage classes are grouped accordingly. Soils that are poorly or imperfectly drained as a result of a perched water table (i.e., extremely slowly permeable subsoil, permeability less than 0.1 cm/hr) can be rated one class higher.
[3]Class definitions from Canada Soil Survey Committee, Subcommittee on Soil Classification. *The Canadian system of soil classification*. Ottawa, Ont.: Supply and Services Canada, Can. Dep. Agric. Publ. 1646; 1978; 164 p.
[4]This reflects the soils ability to retard the movement of leachate from landfills. It is based on constant head hydraulic conductivity tests run on core samples.
[5]The subsoil texture reflects the ease of excavation and trafficability.
[6]Because the bedrock is a Pennsylvanian sandstone (with numerous cracks), its ability to act as a filtering agent is poor. This can result in contamination of the groundwater and wells using it.
[7]In the survey area the surface stones tend to be relatively small in size (usually less than 50 cm). They do not cause as serious a handicap as would an equal volume of large stones; however, in large quantities they still cause severe interference to landfill operations.

Soil limitations for trench-type sanitary landfill

Because of the shallowness of the soils in the survey area, the area-type sanitary landfill is more appropriate than the trench-type. Trenches, commonly 3–5 m deep, either penetrate the sandstone bedrock or come close to it; either situation results in leachates (pollutants) flowing into the groundwater. The only soil in which the trench-type sanitary landfill approach might be feasible is the Fundy association (FU). These deposits generally tend to be thicker, and although they usually have minimum drainage (imperfectly, poorly, or very poorly drained), it is generally the result of a perched water table, which is not likely to cause groundwater pollution problems. The major difficulty with these soils is the poor trafficability created by their texture (silty clay loam to silty clay), which rate no higher than "moderate."

Soil limitations for local roads and streets (all-weather surfaces)

The limitations for local roads and streets refer to the use of the soil for construction and maintenance of local roads and streets that have all-weather surfacing, usually asphalt, and are subject to automobile traffic all year. The roads and streets consist of a subgrade, usually of underlying local soil material; a subbase of a stable material such as gravel or crushed rock; and the actual road surface or pavement, usually asphalt, or in some rural areas, gravel with a binder. Standard construction practices are assumed in regard to drainage measures and road grading for shedding water. Most of the soil material used in road construction comes from the soil at hand. This guide is less applicable to the requirements for superhighways.

The soil properties used as criteria for limitation ratings are those that affect general load-carrying capacity and service characteristics and those that affect the basic construction. Load-carrying capacity is indicated by the American Association of State Highway Officials (AASHO)[13] and Unified Soil Classification System ratings and the shrink-swell potential. Service characteristics are affected by depth to the seasonal high water table, flood hazard, and susceptibility to frost action. Slope, depth to bedrock, surface stoniness, and drainage are all related to construction requirements.

See Table 7 for criteria used in rating soils for local roads and streets (all-weather surfaces).

Soil limitations for recreation

Recreation uses have been divided into athletic fields and outdoor living (tent and trailer parks and picnic areas). Each is described separately and corresponding soil limitation guides have been established.

Athletic fields

These limitations rate soils intended to be used as athletic fields for organized games such as baseball, football, soccer, and other sports with similar requirements. The completed field is expected to be almost level and capable of intensive foot traffic without serious problems. The possible need to haul in fill material or topsoil is not considered in this rating. The soil criteria used in the ratings are those that affect construction (depth to water table, slope, depth to bedrock, and surface coarse fragments), use (depth to water table, permeability, and flooding), and maintenance (permeability, flooding, available moisture for turf, surface texture, and susceptibility to frost action).

See Table 8 for criteria used in rating soils for athletic fields.

Outdoor living

These ratings refer to soils intended to be used intensively for park-type roadside stops for picnicking or tent and trailer campsites. Other than some basic site preparation, such as cleaning around picnic tables and intended tent location areas and some grading for trailer sites, little is disturbed. Problems of sewage disposal, water supply, accessibility, aesthetic values, and possible hazards to fragile plant communities are not used as rating criteria. Vehicular traffic is assumed to be confined to access roads. Except as influenced by moisture, the ability of the soil to maintain adequate vegetation is not a factor. The site must be capable of being subjected to intensive use (foot traffic) without serious consequences.

Because construction is minimal, the soil properties of greatest concern are those that interfere directly with the intended use (wetness related to the depth to the water table during the period of use, flooding, permeability related to "drying out" in the spring and after rainstorms, slope, surface coarse fragments, and depth to bedrock) and those that affect maintenance (flooding, permeability, available moisture for adequate vegetation growth, and surface texture related to trafficability).

See Table 9 for criteria used in rating soils for outdoor living.

Soil limitations for forestry

The interpretations for forest soils presented here are related to woodland management. Degrees of limitation—slight to none, moderate, and severe are defined for construction of access roads, equipment limitations, erosion hazards (potential); and windthrow hazards. As well as the above, two additional interpretations are for species suitability and land capability classifications for forestry.

At present, productivity ratings for soil units are estimates, because problems remain in measuring "true" productivity. The major difficulty is the variability of natural stands due to differences in density and stand history (insect infestations, fire, high-grading, and so on). Interpreting the intricate relationships between forest soils and silvicultural practices is an even more difficult task. Insufficient knowledge is available to make such interpretations with any degree of accuracy. However, as forest use becomes more intensive, these relationships will be determined and they can be applied to the various soil units to maximize productivity.

Because these interpretations are based on soil survey information collected for various reasons, the soils may be differentiated more than would be necessary for forestry use alone. Many of the mapping units have the same or similar degrees of limitation for various forestry uses and can be grouped into single forest soil management units.

Be careful how you use this information. It has inherent limitations due to the nature of the areas under consideration and the level of survey. Forested areas have restricted accessibility (see accessibility map), which makes mapping more dependent on photo interpretation with fewer field checks for verification. Although forest vegetation is an aid in identifying some soil characteristics, it is a severe hindrance in other photo interpretations. This is a reconnaissance level soil survey (low to moderate intensity), therefore the soils are less precisely mapped than in detailed projects. Inclusions of minor soils that differ from the major soil are common and can be expected to occupy up to 20% of a mapping unit. Such inclusions require varied management and so soil identification becomes a valuable asset for the forester.

For special silvicultural projects where more detailed soils information is required, additional detailed soil surveys should be carried out. The information provided in this report can be used to locate the general areas of soils most suitable for the intended purpose.

[13]AASHO, standard specification for highway materials and methods of sampling and testing, part II, 7th ed., 1955.

Table 7. Soil limitations for local roads and streets (all-weather surfaces)[1]

Major Soil Properties influencing uses	Degree of limitation		
	Slight to none	Moderate	Severe
Depth to seasonal high water table	greater than 1 m (rapidly and well drained)[2]	1–0.20 m (moderately well and imperfectly)	less than 0.20 m (poorly and very poorly drained)
Slope[2,3]	0–5% (a,b,c)	5–15% (d,e)	15–20% (part of f)
Depth to bedrock[4]	greater than 0.5 m	0.5–0.25 m	less than 0.25 m
Surface stoniness[2,5]	S0, S1, S2 (stones 2–10 m apart and greater)	S3 (stones 0.5–2 m apart)	S4, S5 (stones 0.1–0.5 m apart and less)
Flood hazard	not subject to flooding	subject to occasional flooding (less than once in 5 years)	subject to flooding (more than once in 5 years)
Subgrade[6]			
AASHO[7]	A–1, A–2, A–3	A–4, A–5	A–6, A–7
Unified[8]	GW, GP, SW, SP, GM[9], GC[9], SM[9], SC[9]	CL (PI[10] less than 15)	CL (PI[10] greater than 15), ML, CH, MH, OH, OL
Shrink-swell potential[11]	Except for the Fundy (FU), Tracadie (TD), and Mount Hope (MH) associations, which have a moderate shrink-swell potential, this factor is of slight to no limitation for all the soils.		
Susceptibility to frost action:[12]	low	moderate	high
well and imperfectly drained	GW, GP, SW, SP	GM, GC, SM, SC, CL	ML, MH
poorly drained	GW, GP	SW, SP, GC, CL	GM, SM, SC, ML, MH

A fourth degree of soil limitation is also defined for local roads and streets:

Unsuitable: slopes greater than 20%
yearly flooding
organic soils

[1]Limitation based on Rose, R.D., et al. *Use of soils in the fourteen-county Appalachia region of New York State*. Agronomy Mimeo. 69–5; 1969. Dept. of Agronomy, Cornell Univ. USDA Soil Conservation Service. *Guide for interpreting engineering uses of soils*. Soils Memorandum SCS-45 (Rev. 2): Holland, W. D., Coen, G. M.: *Soils of Waterton Lakes National Park, Alberta*. Alberta Institute of Pedology, Information Report NOR-X-65; 1976.

[2]Class definitions from Canada Soil Survey Committee, Subcommittee on Soil Classification. *The Canadian system of soil classification*. Ottawa, Ont.: Supply and Services Canada; Can. Dep. Agric. Publ. 1646; 1978: 164 p.

[3]Due to winter conditions limitation classes for slope have been altered from standards as set in references.

[4]The bedrock, being of rippable Pennsylvanian sandstone, has a surface layer about 0.5–0 m thick, which can be easily excavated by light powered equipment. Below this the bedrock material is more difficult to extract but still is easily movable with the type of equipment used in road construction. "Depth to bedrock" limits are set accordingly and thus may deviate from the standard.

[5]In this survey area the surface stones are usually less than 50 cm in size. For equipment used in road construction they present little problem to move, however, in excess quantities they seriously interfere with operations.

[6]This rates the general load-carrying capacity and service characteristics of the soil as it applies to subgrades or roadbeds.

[7]Ratings according to AASHO Designation D3283-73 taken from General Rating as Subgrade, Table V-2, *Soils manual for design of asphalt pavement structures*. The Asphalt Institute, College Park Maryland, USA; 1961.

[8]Unified soil group ratings according to Designation D2487-69.

[9]Downgrade limitation to moderate if more than 30% passes No. 200 sieve.

[10]PI means plasticity index.

[11]Shrink-swell potential based on plasticity index ranges as established by Coen and Holland in *Soils of Waterton Lakes National Park, Alberta*. Alberta Institute of Pedology, Information Report NOR-X-65, 1976.

[12]Susceptibility to frost action based on the USDA Soil Conservation Service. *Guide for interpreting engineering uses of soils*. Soils Memorandum SCS-45 rev. ed. 1976. Some modifications were made. Proper road construction includes preventative measures, which minimize or eliminate frost activity.

Table 8. Soil limitations for athletic fields[1]

Major Soil Properties influencing uses	Degree of limitation		
	Slight to none	Moderate	Severe
Depth to water table during period of use	greater than 0.75 m (rapidly,[2] well and moderately well drained)	0.75–0.5 m (imperfectly drained)	less than 0.5 m (poorly drained)
Permeability[3] (surface 30 cm)	greater than 2.0 cm/hr	less than 2.0 cm/hr	this rating not used
Flooding	floods less than once in 5 years during heavy use period	this rating not used	floods more than once in 5 years during heavy use period
Slope[2]	0–2% (a,b)	2–5% (c)	5–9% (d)
Available moisture[4]	slight or no moisture deficiency: greater than 9 cm of available moisture	moderate moisture deficiency: 5–9 cm of available moisture	severe moisture deficiency: less than 5 cm of available moisture
Surface texture[2,5]	sandy loam, loam, silt loam[6]	clay loam, sandy clay loam, silt clay loam, loamy sand[6]	sandy clay, silty clay, clay, sand, organic
Depth to bedrock[7]	greater than 1 m	1–0.5 m	less than 0.5 m
Coarse fragments on the surface[2]			
gravel and cobbles	less than 3%	3–20%	greater than 20%
stones[8]	S0, S1 (stones 10–30 m apart and greater)	S2 (stones 2–10 m apart)	S3 (stones 0.5–2 m apart)
Susceptibility to frost action	low	moderate	high
well and imperfectly drained	GW, GP, SW, SP	GM, GC, SM, SC, CL	ML, MH
poorly drained	GW, GP	SW, SP, GC, CL	GM, SM, SC, ML, MH

A fourth degree of soil limitation is also defined for athletic fields:

Unsuitable: persistent wetness
yearly flooding
organic soils
slopes greater than 9%
stoniness S4 and S5
more than 50% gravel and cobbles

[1]Limitation based on Rose, R. D., et al. *Use of soils in the fourteen-county Appalachia region of New York State*. Agronomy Mimeo. 69–5: 1969. Dept. of Agronomy, Cornell Univ. Coen, G. M.; Holland, W. D. *Soils of Waterton Lakes National Park, Alberta*. Alberta Institute of Pedology, Information Report NOR-X- 65; 1976.

[2]Class definitions from Canada Soil Survey Committee, Subcommittee on Soil Classification. 1978. *The Canadian system of soil classification*. Ottawa, Ont.: Supply and Services Canada; Can. Dep. Agric. Publ. 1646; 1978: 164 p.

[3]This item reflects the ability of the soils to dry out in the spring and also after rains. Based on constant head hydraulic conductivity tests run on core samples.

[4]This item attempts to show possible moisture deficiencies as related to moisture requirements for adequate vegetative growth. Class limits are based on the available moisture in the top 50 cm of soils.

[5]Surface texture is related to maintenance as it effects trafficability, wetness conditions after rainfalls, and wind erosion.

[6]Surface soils of this texture may be subject to wind erosion and, if so, should be downgraded one class.

[7]The bedrock is rippable Pennsylvanian sandstone.

[8]On the average the stones are less than 50 cm and can be moved with light equipment, or even by hand.

[9]Susceptibility to frost action based on the USDA Soil Conservation Service. *Guide for interpreting engineering uses of soils*. Soils Memorandum SCS-45, rev. ed. 1976. Some modifications were made. Frost heaving of a soil can have disastrous effects on athletic field conditons.

Table 9. Soil limitations for outdoor living[1]

Major Soil Properties influencing uses	Degree of limitation		
	Slight to none	Moderate	Severe
Depth to water table during period of use			
tent and trailer	greater than 0.75 m (rapidly,[2] well, and moderately well drained)	0.75–0.5 m (imperfectly drained)	less than 0.5 m (poorly drained)
picnic areas	greater than 0.4 m (rapidly, well, and moderately well drained)	greater than 0.4 m (imperfectly drained)	less than 0.4 m (poorly drained)
Flooding			
tent and trailer parks	floods less than once in 10 years during season of use	floods less than once in 5 years during season of use	floods more than once in 5 years during season of use
picnic areas	floods less than once in 5 years during season of use	floods less than once in 3–5 years during season of use	floods more than once in 3 years during season of use
Permeability[3] (surface 30 cm)	greater than 1.0 cm/hr	less than 1.0 cm/hr	this rating not used
Slope[2]			
tent and trailer parks	0–5%	5–9%	9–15%
picnic areas	0–9%	9–15%	15–30%
Depth to bedrock	greater than 0.5 m	less than 0.5 m	this rating not used
Available moisture[4]	slight or no moisture deficiency; greater than 9 cm of available moisture	moderate moisture deficiency; 5–9 cm of available moisture	severe moisture deficiency; less than 5 cm of available moisture
Surface texture [2,5]	sandy loam, loam, silt loam	clay loam, sandy clay loam, silt clay loam, loamy sand, stable sand	sandy clay, silty clay, clay, loose sand
Surface coarse fragments[2]			
gravel and cobbles	less than 20%	20–50%	greater than 50%
stones	S0, S1, S2 (stones 2–10 m apart or greater)	S3 (stones 0.5–2 m apart)	S4 (stones 0.1–0.5 m apart)

A fourth degree of soil limitation is also defined for outdoor living:

Unsuitable: permanently wet soils
slopes greater than 30% for picnicking and tenting
slopes greater than 15% for trailer parks
yearly flooding
stoniness, S5 (stones less than 0.1 m apart)
organic soils

[1]Limitation based on Rose, R. D., et al. *Use of soils in the fourteen-county Appalachia region of New York State*. Agronomy Mimeo. 69–5; 1969. Dept. of Agronomy, Cornell Univ. Coen, G. M.; Holland, W. D. *Soils of Waterton Lakes National Park, Alberta*. Alberta Institute of Pedology, Information Report NOR-X-65; 1976.
[2]Class definitions from Canada Soil Survey Committee, on Soil Classification. *The Canadian system of soil classification*. Ottawa, Ont.: Supply and Services Canada, Can. Dep. Agric. Publ. 1646; 1978; 164 p.
[3]This reflects the soils ability to dry out in the spring and after rainstorms. It is based on constant head hydraulic conductivity tests run on core samples.
[4]This item attempts to evaluate the adequacy of moisture for vegetative growth. Class limits are based on the available moisture in the top 50 cm of soil.
[5]Surface texture is related to surface wetness after rainfalls, dustiness, and trafficability.

Table 10. Soil limitations for construction of access roads[1]

Major Soil Properties influencing uses	Degree of limitation		
	Slight to none	Moderate	Severe
Drainage[2]	rapidly, well, and moderately well drained	imperfectly[6] drained	poorly[6] and very poorly drained
Material suitability[3]	GW, GP, SW, SP, GM,[4] GC,[4] SM,[4] SC[4]	CL (PI[5] less than 15)	CL (PI[5] greater than 15) ML, CH, MH
Slope	0–5% (a,b,c)	5–15% (d,e)	15% (f,g,h)
Stoniness[2]	S1, S2, S3	S4	>S5

[1]Access roads are designed for low speeds and are usually constructed of on-site materials with little or no hauling of fill. Main haul roads can be interpreted under soil limitations for local roads and streets. *NOTE:* Organic soils encountered during construction of access roads will most likely be shallow (terric or lithic) and rate severe.
[2]Class definitions from Canada Soil Survey Committee, Subcommittee on Soil Classification. *The Canadian system of soil classification*. Ottawa, Ont.: Supply and Services Canada, Can. Dep. Agric. Publ. 1646; 1978: 164 p.
[3]Material suitability is based on the Unified Classification System.
[4]Downgrade to moderate if more than 35% passes the No. 200 sieve and road construction and use are intended for each spring.
[5]PI means plasticity index.
[6]Upgrade one class if coarse loamy ablational till or outwash gravel.

Construction of access roads

Road construction is a major function of all woodlands operations. Regardless of the size or the type of forest operation, roads are required to provide access to the work area. Ignoring soil properties can lead to significantly increased costs associated with construction and maintenance that otherwise could be reduced or avoided by the application of soils information. By identifying problem areas, access road systems can be laid out to take advantage of more suitable routes, or they can be built and used at those times during the year when soil conditions are most favorable.

See Table 10 for criteria used in rating soils for construction of access roads.

Equipment limitations

This rating indicates the degree to which topographic conditions (slope) and soil characteristics (drainage, texture, and stoniness) influence or restrict the use of equipment commonly used in woodlands operations, based on both degree of difficulty of machine operation and potential soil damage. It is assumed that rubber-tired skidders and forwarders are used; therefore, as harvesting systems become more mechanized and machine types change, additional constraints will have to be considered.

See Table 11 for criteria used in rating soils for equipment use.

Erosion hazards (potential)

Under present conditions, forest soil erosion problems are minor. The erosion that does occur is usually gullying, associated with skid trails, access roads, and fire lanes, where the mineral subsoil is exposed. Although this erosion may not be highly significant, it is still environmentally undesirable. As forest use becomes more intensive, conditions of increased susceptibility to erosion can be predicted. Therefore, it is beneficial to have a general guide to soil erodibility.

Mineral soil losses resulting from water erosion are dependent on the effects of rainfall (intensity and amount), vegetative cover, topography (slope gradient and length), and soil properties (infiltration capacity, texture, and structural stability). Customarily, rainfall within the survey area is neither exceptionally heavy (90–95 cm annually) nor particularly intense. The vegetative cover of the forest and understory, even after harvesting, provide good natural protection. Most of the slopes are under 9%, with a majority in the 0.5–5% range. Slope lengths are relatively short, which reduces the potential hazard of water concentration. Hence, the determining factor or factors for erosion are soil properties related to the degree of slope.

The guide presented in Table 12 is based on the assumption that gullying is the major form of erosion. Few situations created by forest operations are conducive to sheet erosion.

Windthrow hazards

One of the major functions of a tree's roots is to support the aboveground portion of the tree. Under optimum conditions, the rooting systems of trees are usually sufficient for this purpose; some species, however, are more prone to windfall than others. When the natural environment is altered to such an extent that the tree becomes openly exposed to the elements, the root system, which developed and was adequate to support the tree under sheltered forest conditions, may fail. Examples of this are the increased occurrence of uprooting along the edges of road rights-of-way and clearings. Although exposure increases the risk of trees being blown over, the physical conditions of the soil and the depth and extent of rooting of individual trees or tree species ultimately determines whether or not windthrow will occur within the forest. (The topography of the survey area is

Table 11. Soil limitations for equipment use[1]

Major Soil Properties influencing uses	Degree of limitation		
	Slight to none	Moderate	Severe
Soil drainage class[1]			
less than 35% silt and clay	rapidly, well, moderately well, and imperfectly drained	poorly drained	very poorly drained
35–70% silt and clay	well, moderately well drained	imperfectly and poorly[2] drained	very poorly drained
more than 70% silt and clay	moderately well drained	imperfectly[3] drained	poorly and very poorly drained
Slope[1]	0–9% (a,b,c,d)	9–30% (e,f)	more than 30% (g plus)
Stoniness[1]	S1, S2, S3	S4	S5

Note: These ratings do not apply to organic soils.
[1]Class definitions from Canada Soil Committee, Subcommittee on Soil Classification. *The Canadian system of soil classification*. Ottawa, Ont.: Supply and Services Canada, Can. Dep. Agric. Publ. 1646; 1978: 164 p.
[2]Downgrade one class if operations carried out during early spring.
[3]Downgrade one class if operations carried out in early spring or late fall.

Table 12. Soil susceptibility to erosion[1]

Major Soil Properties influencing interpretation	Degree of limitation		
	Slight to none	Moderate	Severe
Slope[1]			
permeability at 100 cm depth: more than 0.5 cm/hr	a,b,c,d[2] (0–9%)	e,[4]f[2] (9–25%)	f,g (25% +)
permeability at 100 cm depth: less than 0.5 cm/hr	a,b,c, (0–5%)	d,e[3] (5–15%)	f,g (15% +)

Note: These ratings do not apply to organic soils.
[1]Class definitions from Canada Soil Survey Committee, Subcommittee on Soil Classification. *The Canadian system of soil classification*. Ottawa, Ont.: Supply and Services Canada, Can. Dep. Agric. Publ. 1646; 1978: 164 p.
[2]Downgrade one class if applicable amount of fine sand or silt or both.
[3]Downgrade one class if texture is silty clay (SiC) or silty clay loam (SiCL).
[4]Upgrade one class if gravel.

gently undulating to nearly level and its role is one of low significance in determining windthrow hazards.) The soil characteristics that affect windthrow follow:

Depth of suitable mineral soil over a restricting layer such as bedrock, hardpans, dense compact tills, and other root-inhibiting layers. The suitability of a soil for root growth is related to soil aeration, available moisture and nutrients, and ease of root penetration.

Drainage affects the rooting depth (by acting as an inhibitor) and the mechanical strength of the soil.

Stoniness reduces the space available for proper root growth.

Table 13 gives the criteria used in rating soils for windthrow potential.

Species suitability

Soil–tree species suitability ratings (in the interpretation guide sheet) are the result of correlating species characteristics (or silvics) with corresponding soil properties. This was coupled with observations made in the field. No attempt is made to categorize the degree of suitability other than to list the species that are suitable or of limited suitability. The species are not listed in any order of suitability. Only tree species of commercial use are considered.

The information in the interpretation sheets can be used as a guide for determining which species to plant in artificial regeneration.

Table 13. Soil susceptibility to windthrow[1]

Major Soil Properties influencing interpretation	Degree of limitation		
	Slight to none	Moderate	Severe
Depth of restricting layer	more than 50 cm[1]	20–50 cm	less than 20 cm
Soil drainage[2]	rapidly, well, moderately well, and imperfectly[3] drained	poorly drained	very poorly drained
Stoniness[2]	S1, S2, S3	S4	S5

Note: These ratings do not apply to organic soils.
[1]If the texture of the rooting zone is predominantly sand or silty clay to clay, lower the rating to moderate. (These textures tend to inhibit proper root growth or support or both.)
[2]Class definitions from Canada Soil Survey Committee, Subcommittee on Soil Classification. *The Canadian system of soil classification*. Ottawa, Ont.: Supply and Services Canada, Can. Dep. Agric. Publ. 1646; 1978; 164 p.
[3]Downgrade one class for fine loamy and clayey textured soils.

Land capability classifications for forestry

The land capability classification for forestry is based on the soil's ability to grow commercial forests. As defined in the *Land capability classification for forestry*, The Canada Land Inventory Report No. 4, 1967, three categories are used in this system: the capability class, the capability subclass, and the indicator species.

Capability class. When land is assigned to a capability class, the environment of subsoil, soil surface, local and regional climate, as well as the characteristic tree species are taken into account. The capability class is an expression of all the environmental factors affecting tree growth in commercial forests in terms of the degree of limitation to growth. Associated with each capability class is a productivity range based on mean annual increment of the best species or group of species adapted to the site. Expressed in cubic feet per acre per annum, the classes are Class 1, greater than 111 cubic feet; Class 2, 91–110 cubic feet; Class 3, 71–90 cubic feet; Class 4, 51–70 cubic feet; Class 5, 31–50 cubic feet; Class 6, 10–30 cubic feet; and Class 7, less than 10 cubic feet.

Capability subclass. As expressed by the principle of limiting factors, plant response is to a large degree determined by that factor that is least optimum. These factors that limit tree growth are shown as subclasses. Knowledge of the kind of limitation becomes most important, because it allows you to determine the type of forest management that should be used. Silvicultural practices can be planned to overcome or minimize the detrimental effects of a growth-limiting factor. The degree of limitation of the growth-limiting factor determines the class designation.

The capability subclasses used within the survey area are

Climate: U—exposure
(This is significant along the coastal regions, but it is not listed because only soil limitations are considered.)

Soil moisture: M—soil moisture deficiency
W—excess soil moisture

Permeability and depth of rooting zone:
D—physical restriction to rooting caused by dense or consolidated layers other than bedrock
R—restriction of rooting zone by bedrock

Other soil factors:
F— low fertility
I— soils periodically inundated by streams or lakes

Indicator species. The tree species that can be expected to yield the volume associated with each class are shown as part of the symbol. Only indigenous coniferous species adapted to the region and land are shown; exotic species may have higher yields.

Forest capability classification of organic soils

All organic soils are rated 7W, except for some of the Terric Humisols, which are rated 6W.

Suitability of soil as a source of materials

Apart from being used on location, soils are also sources for material. The suitability of the soil as a source of topsoil (for landscaping), sand, gravel, and roadfill are rated for each mapping unit. Four degrees of suitability have been established for each kind of material—good, fair, poor, and unsuitable. Relevant soil properties are listed and limits established for each of the degrees of suitability. The soil's overall rating is determined by that soil property with the lowest suitability rating. These limitations may be accumulative in their effect and therefore the soil may be downgraded so that the soil's suitability rating may be even lower than that determined by its least suitable property. This decision is left to the discretion of the interpreter.

Table 14. Soil suitability as a source for topsoil[1]

Major Soil Properties influencing uses	Degree of suitability		
	Good	Fair	Poor
Moist consistence[2]	very friable, friable	loose, firm	very firm
Texture[2]	loam, silt loam, sandy loam	clay loam, silty clay loam	sand, loamy sand
Thickness of material	greater than 40 cm	40–20 cm	20–10 cm
Coarse fragments-gravel and cobbles[2] (% by volume)	less than 3%	3–15%	15–40%
Surface stoniness[2]	S0 (stones more than 30 m to apart)	S1 (stones 10–30 m apart)	S2, S3 (stones 0.5–10 m apart)
Slope[2]	less than 5% (a,b,c)	5–9% (d)	9–15% (e)
Soil drainage[2] (depth to seasonal high water table)	better than poorly drained (greater than 0.2 m to water table)	better than very poorly drained (greater than 0.1 m to water table)	very poorly drained (less than 0.1 m to water table)

A fourth degree of soil suitability is also defined for use as a source for topsoil:

Unsuitable: less than 10 cm of material
greater than 40% coarse fragments
stoniness S4 and S5 (stones 0.1–0.5 m apart or less)
slopes greater than 15%
organic soils

[1]Limitations based on USDA Soil Conservation Service. *Guide for interpreting engineering uses of soils*. Soils memorandum SCS-45 rev. ed. 1976.
[2]Class definitions from Canada Soil Survey Committee, Subcommittee on Soil Classification. 1978. *The Canadian system of soil classification*. Ottawa, Ont.: Supply and Services Canada, Can. Dep. Agric. Publ. 1646; 1978; 164 p.

Caution: Soils rated as unsuitable are of such low quality that they are impractical for particular use. Unsuitable is easily defined for sand and gravel, but harder for topsoil and roadfill. Therefore, arbitrary limits have been established that distinguish usable from unusable sources.

Topsoil

The suitability of a soil for use as topsoil relates to its use for surfacing lawns, gardens, roadbanks, and other landscaped sites. It also affects decisions to stockpile surface soil at construction sites, the advisability of this being dependent on topsoil quality and the availability of other topsoil nearby. Whatever the reason, the basic aim of topsoiling is to improve soil conditons for reestablishment and maintenance of vegetation or to improve soil conditions where vegetation already exists.

Suitability ratings used are good, fair, and poor; unsuitable is applied to those soils that should not be used. The ratings are for uneroded soils as they occur naturally. The criteria used to determine the degree of suitability are those factors related to the ease or difficulty in obtaining the material (thickness of the material, surface stoniness, slope, and drainage) and the quality of the material (moist consistence, texture, and coarse fragments).

It is assumed that sites from which topsoil is taken must be restored and so the characteristics of the remaining soil material must be adequate for revegetation and erosion control. If restoration is expected to be a problem, the rating should be downgraded to poor or unsuitable, depending upon the severity.

Preferably topsoil should be rich in organic matter. However, organic matter content is not used as a suitability criterion, because it is related to soil consistence, which is used as a rating criterion.

Socioeconomic factors are not taken into consideration; suitability for topsoil is judged without regard for such items as location, site size, site shape, and so on.

See Table 14 for criteria used in rating soil suitability as a source for topsoil.

Sand

The main purpose of rating soil suitability as a source for sand is to guide users to local deposits. This material is used in construction work and is expensive to transport.

The three degrees of suitability are good, fair, and poor. (A fourth rating, unsuitable, is also used to reject soils that have very severe disadvantages.) The suitability ratings are based on ease of excavation as expressed by depth of the material, surface stoniness, slope, and soil drainage; and purity of the source as expressed by subsoil texture and coarse fragment content. This rating results in a general type of classification. Some specific uses may have more severe quality limitations. The degree of suitability is largely dependent on the intended use, and in all cases it has to be verified by site inspection.

Size, shape, and location of the source are not considered as rating criteria. The influence of these factors is related directly to economic feasibility.

See Table 15 for criteria used in rating soil suitability as a source for sand.

Table 15. Soil suitability as a source for sand

Major Soil Properties influencing uses	Degree of suitability		
	Good	Fair	Poor
Depth of material	greater than 1 m	this rating not used	1.0–0.5 m
Subsoil texture[1] (% sand)	sand (greater than 85% sand)	sand (greater than 85% sand)	loamy sand (70–85% sand)
Coarse fragments[1,2] (% by volume)			
gravel	less than 3%	3–15%	greater than 15%
cobbles	0%	less than 3%	greater than 3%
Surface stoniness[1,3]	S0, S1, S2, S3 (stones 0.5–2 m apart or greater)	S4 (stones 0.1–0.5 m apart)	S5 (stones less than 0.1 m apart)
Slope[4]	Slope is usually not a limiting factor in the survey area. Most slopes are less than 9% (d slope) and the majority are 0–5%.		
Soil drainage[1] (depth to average water table level)	better than poorly drained (greater than 0.2 m to water table)	better than poorly drained (greater than 0.2 m to water table)	poorly and very poorly drained (less than 0.2 m to water table)

A fourth degree of soil suitability is also defined for use as a source for sand:

Unsuitable: less than 0.5 m of material
a subsoil with less than 70% sand
greater than 40% coarse fragments (gravel and cobbles combined)

[1]Class definitions from Canada Soil Survey Committee, Subcommittee on Soil Classificaton. *The Canadian system of soil classification*. Ottawa, Ont.: Supply and Services Canada, Can. Dep. Agric. Publ. 1646; 1978: 164 p.
[2]On the average, when a sand source contains more than 15% gravel or 3% cobbles, it becomes necessary to screen it. This results in its suitability being classed as poor.
[3]On the average, surface stoniness does not pose much of a problem because surface stones are not usually associated with sand deposits; if any stones are present, they are usually small in size; site preparation calls for clearing away the vegetation and so stones can be removed at the same time; and areas involved are relatively small.
[4]Features such as kames and eskers tend to have steeper slopes, but because of their size and shape they are easily excavated and can be classified without considering the slope.

Gravel

Gravel is used in great quantities in many kinds of construction work. Because it is expensive to transport because of the weight and the volume required, information beforehand about where to look for the nearest sources can result in substantial savings.

The soil suitability is rated according to the ease of excavation as determined by depth of material, surface stoniness, slope, and soil drainage and the gravel quality as reflected by subsoil texture, coarse fragment content, and gravel hardness. Good, fair, and poor are the first three degrees of suitability; a fourth rating, unsuitable, is used to indicate unacceptable sources. These ratings are not intended for specific uses. They are merely guidelines to help users locate possible sources.

Size, shape, and location of the source are not considered as rating criteria. The economics of the situation dictate whether a source should or should not be developed. It may be less costly to upgrade the output from a lower class source than to transport high-grade material from afar.

On-site investigation is a necessity for detailed planning of site development.

See Table 16 for criteria used in rating soil suitability as a source for gravel.

Road fill

Road fill is soil material used for making road foundations (embankments, subgrades, and so on). When roads are designed, attempts are made to have the volume of fill material required equal (within short distances) the volume of material taken from cuts. Therefore, much of the road fill material comes from the local soil (if it is suitable).

The suitability of the soil as a source of road fill depends on the ease or difficulty in obtaining the soil (as indicated by slope, surface stoniness, and drainage) and the performance of the soil after it is excavated and used as a road foundation (as indicated by compressibility, compactability, and other characteristics as expressed by engineering class ratings; shrink-swell potential; and susceptibility to frost action). The degree of suitability of the soils as related to the above criteria

Table 16. Soil suitability as a source for gravel

Major Soil Properties influencing uses	Degree of suitability		
	Good	Fair	Poor
Depth of material	Within the survey area, most gravel deposits tend to be relatively thick (greater than one meter and usually several meters or more thick). Depths of the magnitude are beyond the scope of this report.		
Subsoil texture[1]	very gravelly sand, gravel	very gravelly sand, gravelly sand, very gravelly loamy sand, gravelly loamy sand	gravelly sand, gravelly loamy sand, gravelly sandy loam
Coarse fragments[1] (% by volume)			
gravel	greater than 60%	40–60%	20–40%
cobbles[2]	less than 5% (close to gravel size)	5–15%	15–40%
Surface stoniness[1,3]	S0, S1, S2, S3 (stones 0.5–2 m apart or greater)	S3, S4, S5 (stones 0.1–.05 m apart or less)	this rating not used
Slope[4]	Slope is usually not a limiting factor in the survey area. Most slopes are less than 9% (d slope) with the majority being 0.5 to 5% (b and c slopes).		
Soil drainage[1] (depth to average water table level)	better than poorly drained (greater than 0.2 m to water table)	better than poorly drained (greater than 0.2 m to water table)	poorly and very poorly drained (less than 0.2 m to table)
Gravel hardness	hard gravel[5]	soft gravel[6]	this rating not used

A fourth degree of soil suitability is also defined for use as a source for gravel:

Unsuitable: subsoil textures heavier than those mentioned
less than 20% gravel
more than 40% cobbles

[1]Class definition from Canada Soil Survey Committee, Subcommittee on Soil Classification. *The Canadian system of soil classification*. Ottawa, Ont.: Supply and Services Canada, Can. Dep. Agric. Publ. 1646; 1978: 164 p.
[2]When the percentage of cobbles is over 15%, screening is necessary to remove them and so the suitability of the source becomes "poor".
[3]Surface stoniness is not much of a problem for the following reasons: surface stones are usually not associated with the types of soils that are gravel sources; if any stones are present, they are usually small; site preparation calls for tree and other vegetation removal and so stone removal can be done at the same time; and excavations are usually in the form of pits (little surface area).
[4]Features such as kames and eskers tend to have steep slopes, but because of their size and shape they are easily excavated.
[5]Within the survey area, those deposits specified as being of hard gravel consist mainly of: granites, gneisses, schists, and quartzite.
[6]Within the survey area, those deposits specified as being of soft gravel consist mainly of soft sandstone.

is reflected by ratings of good, fair, and poor. Some soils with very severe disabilities are rated unsuitable.

Location of the source is not considered as a rating criterion.

See Table 17 for criteria used in rating soil suitability as a source for road fill.

Some physical and chemical properties

In this section of the interpretation guide sheet, soil properties significant to a number of possible uses are discussed. Evaluations are made for various soil layers (based on depth from the surface of the mineral soil), which are different enough from each other to have an effect on their use. The estimated values are based on laboratory sample analysis, field observations made in the course of routine mapping, and experience. The following are brief explanations of these properties.

Bulk density

The bulk density of soil is the mass or weight of oven-dried soil per unit of field moist-bulk volume, expressed in g/cm^3. Determinations are based on core samples.

Unified classification

The unified soil classification system classifies soils according to their values as subgrades. The soils are identified and grouped on the basis of particle size, distribution, plasticity, liquid limit, and organic matter content. Three broad divisions are established: coarse-grained soils, which include eight classes, GW, GP, GM, GC, SW, SP, SM, and

Table 17. Soil suitability as a source for road fill[1]

Major Soil Properties influencing uses	Degree of suitability		
	Good	Fair	Poor
Engineering classes:			
Unified Class	GW, GP, SW, SP, GM,[2] GC,[2] SM,[2] SC[2]	CL (PI[3] less than 15%)	CL (PI[3] greater than 15%) ML, OL, MH, CH, OH
AASHO Class	A–1, A–2, A–3	A–4, A–5	A–6, A–7
Shrink-swell potential[4]	Except for the Fundy (FU) and Mount Hole (MH) associations, which have a moderate (fair) shrink-swell potential, this factor is of no significance in this area of New Brunswick.		
Susceptibility to frost action[5]:	low	moderate	high
Well-drained roadbeds	GW, GP, SW, SP	GM, GC, SM, SC, CL	ML, MH
Poorly drained roadbeds	GW, GP	SW, SP, GC, CL	GM, SM, SC, ML, MH
Slope[6,7]	0–15% (a,b,c,d,e)	15–30% (f)	30–45% (part of g)
Surface stoniness[6]	S0, S1, S2, S3 (stones 0.5–2 meters apart and greater)	S4 (stones 0.1–0.5 meters apart)	S5 (stones less than 0.1 meters apart)
Drainage class[6] (depth to average water table level)	Rapidly, well and moderately well drained (greater than 1 meter to water table)	Imperfectly drained (1.0–0.2 meters to water table)	Poorly and very poorly drained (less than 0.2 meters to water table)
Depth to bedrock	Depth to bedrock has no effect on soil suitability. The bedrock is a soft, rippable Pennsylvanian sandstone which can be easily excavated and used as a source of fill itself.		

A fourth degree of soil suitability is also defined for use as a source for road fill:

Unsuitable: slopes greater than 45%
organic soils

[1]Limitations based on: USDA Soil Conservation Service. *Guide for interpreting engineering uses of soils*. Soils memorandum SCS-45, rev. ed. 1976.
[2]The suitability rating is downgraded to fair if the content of fine soil (material passing No. 200 sieve) is more than 30%.
[3]PI means plasticity index.
[4]Shrink-swell potential based on plasticity index ranges as established by Coen and Holland in *Soils of Waterton Lakes National Park, Alberta*. Alberta Institute of Pedology, Information Report NOR-X-65, 1976.
[5]Susceptibility to frost action based on the USDA Soil Conservation Service. *Guide for interpreting engineering uses of soils*. Soils memorandum SCS-45, rev. ed. 1976. Soil ratings are based on the assumption that excavated material, irregardless of original drainage, will be well drained in its new position. Should this not be the case, the ratings will have to be modified according to the susceptibility to frost action listed under poorly drained roadbeds.
[6]Class definitions from Canada Soil Survey Committee, Subcommittee on Soil Classification. *The Canadian system of soil classification*. Ottawa, Ont.: Supply and Services Canada, Can. Dep. Agric. Publ. 1646; 1978: 164 p.
[7]The slope ratings can be ignored under some circumstances. Features such as kames and eskers tend to have steeper slopes but because of their size and shape they are easily excavated.

SC; fine-grained soils, which include six classes, ML, CL, OL, MH, CH, and OH; and highly organic soils, which include one class, Pt. These letter symbols are derived either from the terms used in soil mechanics to describe the soil fraction (gravel, sand, silt, clay, peat, and so on), the relative value of the liquid limit (high or low), or the relative gradation (well graded or poorly graded). For a detailed description of this system, see *Soils manual for design of asphalt pavement structures*, Manual Series No. 10, College Park, Maryland: The Asphalt Institute; 1969.

AASHO classification

The AASHO system of soil classification is based on the performance of soils under highway use. According to this system, soils having about the same general load-carrying capacity and service characteristics are grouped together to form seven basic groups that are designated A-1 through A-7. In general, the best soils for highway subgrades are classed as A-1 and the classes are progressively worse with A-7 the poorest subgrade material. For more information, see *Soils manual for design of asphalt pavement structures*, Manual Series No. 10, College Park, Maryland: The Asphalt Institute; 1969.

Percent coarse fragments

Fragments that are too large to be classified as soil, that is, that are greater than 2 mm in size, are called coarse fragments. These fragments consist of various-sized components: gravel, 2 mm – 7.5 cm; cobbles, 7.5–25 cm; and stones, larger than 25 cm.

Soil

Soil as defined here refers to the fine earth fraction (less than 2 mm) of the soil material. The three fractions or separates recognized are based on the size of the soil particles:

Sand—soil particles 2.0–0.05 mm in diam

Silt—soil particles 0.05–0.002 mm in diam

Clay—soil particles less than 0.002 mm in diam

The percentages of sand, silt, and clay are by weight and are based on the fine earth fraction; they total 100%. These values were calculated by laboratory analysis with the use of the hydrometer method. If laboratory results were not available, estimates were devised by extrapolating from similar soils.

Permeability

Permeability is that quality of a soil that allows it to transmit water or air. The estimated values are either from laboratory results (constant head method for determining hydraulic conductivity as described in *Methods of soil analysis*[14] or are based on soil characteristics (structure, texture, and so on) and field observations (such as ponding after rainstorms).

Available water

Available water measures the capacity of a soil to hold water that can be readily absorbed by plant roots. It is defined here as the difference between the amount of water in the soil at field capacity (about 33 kPa holding pressure) and the amount in the soil at wilting point (about 1.5 MPa holding pressure). It is expressed in centimetres of water per centimetre of soil.

pH value

The degree of acidity or alkalinity of a soil is expressed in terms of the pH scale (technically, the negative logarithm of the hydrogen-ion activity of a soil). The values are for pH determinations made in water (H_2O).

Soil interpretation guide sheets for each mineral soil association

The interpretation guide sheets were made for individual soil units of each association. Commonly a group of similar soil units of an association appear on the same guide sheet. The guide sheets are arranged in alphabetical order of the name of the association.

In general, there is insufficient information concerning the usage of the organic soil associations. Therefore, there are no guide sheets for the organic soils. Also there are no guide sheets for the nonsoil units (land types).

The interpretation guide sheet includes:

- tables of limitations for farmland, community development, and recreation uses
- degree of limitation affecting woodland uses
- suitability of soil as a source of materials
- soil features affecting specified engineering uses
- some estimated physical and chemical properties.

The guide of use for the limitation table and the criteria used to set up the limitation tables were discussed earlier in this report. The rating of suitability of soil as a source of material was also discussed previously.

The soil capability classification for agriculture is rated according to The Canada Land Inventory Report No. 2, 1965. Most of the ratings are straightforward. However, there are some questions on the rating of map units HT2, SG2, and Sb2 as class 3D instead of class 4D.

[14] American Society of Agronomy. Methods of soil analysis, Part 1. Black, C. A. et al., eds. Agronomy No. 9. Madison, WI: American Society of Agronomy; 1965.

Baie-du-Vin Association

Soil units: BVI, BV2 **Area:** 6087 ha

Description of soil

These are predominantly rapidly drained, shallow, olive brown, acid, sandy-textured soils, very low in natural fertility, which have formed in loose glacial marine deposits derived mainly from gray green sandstone, over a soft, easily split, Pennsylvanian sandstone bedrock. Total thickness of the soil over bedrock is 10–50 cm, of which the entire depth consists of a loose, rapidly permeable loamy sand material. The surface soil usually lies in direct contact with the bedrock. Coarse fragments of small, flat, platy sandstone, which have lifted up from the bedrock, are few near the surface but become common to many immediately above the soil–bedrock contact. These soils usually occupy crests and upper slope positions in an undulating to almost level landscape and are typically found near the coast.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c,d	severe — depth to bedrock; droughtiness;[1] fertility	4MR
		e	unsuitable — depth to bedrock; droughtiness;[1] fertility; slope	5MT
Vegetable crops		a,b,c,d	severe — droughtiness;[1] depth to bedrock; fertility	
		e	unsuitable — droughtiness; slope	
Septic tanks		all units	unsuitable — rapid permeability; depth to bedrock	
Housing	with basement	a,b,c,d	moderate — depth to bedrock	Note: bedrock may be very easily split, with slight to no limitations
		e	moderate — depth to bedrock; slope	
	without basement	a,b,c,d	moderate — depth to bedrock	
		e	moderate — depth to bedrock; slope	
Sanitary landfill (area-type)		all units	unsuitable — rapid permeability; depth to bedrock	
Local roads and streets		a,b,c	moderate — depth to bedrock	
		d,e	moderate — depth to bedrock; slope	
Athletic fields		a,b	severe — droughtiness[1]	
		c	severe — droughtiness;[1] depth to bedrock	
		d	severe — droughtiness;[1] depth to bedrock; slope	
		e	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c,d	severe — droughtiness[1]	
		e	severe — droughtiness;[1] slope	
	picnic areas	all units	severe — droughtiness[1]	

Note: These soils are shallow phases (10–50 cm to bedrock) of the rapidly drained member of the Richibucto association.

[1]Droughtiness may not be a severe problem where plowing has incorporated sufficient organic matter into the surface mineral soil to increase water-holding capacity.

Soil units: BV1, BV2

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	a,b,c d,e	slight to none moderate	Erosion hazards	a,b,c,d e	slight to none moderate
Equipment limitations	a,b,c,d e	slight to none moderate	Windthrow hazards	all units	moderate
Species suitability	jack pine, red pine, eastern white pine*		Capability class	$\frac{5^M}{jp}$	

*Species of limited suitability.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
poor	poor	unsuitable	good (use bedrock material)

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	10–50 cm of rapidly permeable soil material over a bedrock that is readily permeable in the upper 1 m but extremely slowly permeable below; d-slopes may affect storage capacity
Pond embankment	no subsoil — only surface soil, which has a high compacted permeability
Drainage	not needed
Sprinkler irrigation	very good infiltration rate but very low water-holding capacity; 10–50 cm to bedrock that is readily permeable in the upper 1 m
Road location	10–50 cm to bedrock; cuts and fill necessary on d-slopes and steeper

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–35	1.20–1.40	—	—	<5	75–95	5–15	2–10	>25.0	0.08–0.12	4.0–5.0
35+	soft, easily split, Pennsylvanian sandstone bedrock									

Soil units: BV3, BV4, BV5 Area: 5730 ha

Description of soil

These are predominantly imperfectly drained, shallow, olive brown, acid, sandy-textured soils, very low in natural fertility, which have formed in loose glacial marine deposits derived mainly from gray green sandstone, over a soft, easily split, Pennsylvanian sandstone bedrock. Total thickness of the soil over bedrock is 10–50 cm, of which the entire depth consists of a loose, rapidly permeable loamy sand material. The surface soil usually lies in direct contact with the bedrock. Coarse fragments of small, flat, platy sandstone, which have lifted up from the bedrock, are few near the surface but become common to many immediately above the soil–bedrock contact. These soils usually occupy areas on the edges of depressions and lower slope positions in an undulating to almost level landscape and are typically found near the coast.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	severe — depth to bedrock; fertility; seasonal wetness	4RW
Vegetable crops		all units	severe — depth to bedrock; fertility; seasonal wetness	
Septic tanks		all units	unsuitable — depth to bedrock; permeability	
Housing	with basement	all units	severe — seasonal wetness	
	without basement	a,b,c,d	moderate — seasonal wetness; depth to bedrock	
		e	moderate — seasonal wetness; depth to bedrock; slope	
Sanitary landfill (area-type)		all units	unsuitable — depth to bedrock; permeability	
Local roads and streets		a,b,c	moderate — seasonal wetness; depth to bedrock	
		d,e	moderate — seasonal wetness; depth to bedrock; slope	
Athletic fields		a,b	moderate — seasonal wetness–droughtiness; surface texture if loamy sand; depth to bedrock	
		c	severe — depth to bedrock	
		d	severe — depth to bedrock; slope	
		e	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c	moderate — seasonal wetness–droughtiness; depth to bedrock; surface texture if loamy sand	
		d	moderate — seasonal wetness–droughtiness; depth to bedrock; surface texture if loamy sand; slope	
		e	severe — slope	
	picnic areas	a,b,c,d	moderate — seasonal wetness–droughtiness; depth to bedrock; surface texture if loamy sand	
		e	moderate — seasonal wetness–droughtiness; depth to bedrock; surface texture if loamy sand; slope	

Note: These soils are shallow phases (10–50 cm to bedrock) of the imperfectly drained member of the Richibucto association.

Soil units: BV3, BV4, BV5

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	moderate	Erosion hazards	a,b,c,d e	slight to none moderate
Equipment limitations	a,b,c,d e	slight to none moderate	Windthrow hazards	all units	moderate
Species suitability	jack pine, red pine, eastern white pine		Capability class	BV3, BV4 – $5^{1}_{jp(R)}$	BV5 – 5^{1}_{bs}

Note: Parentheses indicate seasonal variation.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
poor	poor	unsuitable	fair

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	10–50 cm of rapidly permeable soil material over a bedrock that is readily permeable in the upper 1 m but extremely slowly permeable below
Pond embankment	no subsoil — only surface soil, which has a high compacted permeability
Drainage	seasonal wetness; rapidly permeable soil; 10–50 cm to bedrock, bedrock interferes with tile laying
Sprinkler irrigation	seasonal wetness but soil tends to dry out during summer and so irrigation may be beneficial; very good infiltration rate but very low water-holding capacity
Road location	seasonal wetness; 10–50 cm to bedrock

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–35	1.20–1.40	—	—	<5	75–95	5–15	2–10	>25.0	0.08–0.12	4.0–5.0
35+	soft, easily split, Pennsylvanian sandstone bedrock									

Soil units: BV6, BV7 **Area: 2172 ha**

Description of soil

These are predominantly poorly drained, shallow, olive brown, acid, sandy-textured soils, very low in natural fertility, which have formed in loose glacial marine deposits derived mainly from gray green sandstone, over a soft, easily split, Pennsylvanian sandstone bedrock. Total thickness of the soil over bedrock is 10–50 cm, of which the entire depth consists of a loose, rapidly permeable loamy sand material. The surface soil usually lies in direct contact with the bedrock. Coarse fragments of small, flat, platy sandstone, which have lifted up from the bedrock, are few near the surface but become common to many immediately above the soil–bedrock contact. These soils usually occupy depressions and lower slope positions in an almost level to slightly undulating landscape and typically are found near the coast.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	unsuitable — excessive wetness; depth to bedrock	5^{W}_{R}
Vegetable crops		all units	unsuitable — excessive wetness; depth to bedrock	
Septic tanks		all units	unsuitable — rapid permeability; depth to bedrock; high water table	
Housing	with basement	all units	severe (BV6) or unsuitable (BV7) — prolonged wetness	
	without basement	all units	severe (BV6) or unsuitable (BV7) — prolonged wetness	
Sanitary landfill (area-type)		all units	unsuitable — prolonged wetness (true groundwater table); permeability; depth to bedrock	
Local roads and streets		all units	severe — prolonged wetness	
Athletic fields		a,b,c d	severe — prolonged wetness severe — prolonged wetness; slope	
Outdoor living	tent and trailer parks	all units	severe — prolonged wetness	
	picnic areas	all units	severe — prolonged wetness	

Note: These soils are shallow phases (10–50 cm to bedrock) of the poorly drained member of the Richibucto association.

Soil units: BV6, BV7

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe	Erosion hazards	all units	slight to none
Equipment limitations	all units	moderate	Windthrow hazards	all units	severe
Species suitability	black spruce, balsam fir		Capability class	6W bs	

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
unsuitable	poor	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	prolonged wetness; 10–50 cm of rapidly permeable material over a bedrock that is readily permeable in the upper 1 m but is extremely slowly permeable below
Pond embankment	no subsoil — only surface soil, which has a high compacted permeability
Drainage	prolonged wetness; rapidly permeable soil; 10–50 cm to bedrock; bedrock interferes with tiling; outlets may be difficult to find
Sprinkler irrigation	prolonged wetness; must be drained first; very good infiltration rate but very poor water-holding capacity
Road location	prolonged wetness; 10–50 cm to bedrock

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–30	1.20–1.40	—	—	<5	75–95	5–15	2–10	25.0	0.08–0.12	4.0–5.0
30+	soft, easily split Pennsylvanian sandstone bedrock									

Barrieau Association

Soil unit: BA2 **Area: 862 ha**

Description of soil

These are predominantly well to moderately well drained, deep, acid soils, low in natural fertility, which have formed in a moderately thin surficial mantle of glacial marine deposited sandy material derived mainly from gray green sandstone over a fine to clayey textured glacial till derived mainly from red shale and gray green sandstone. The upper material is olive brown, loose, rapidly permeable, loamy sand to sandy loam material, 20–50 cm thick and free of coarse fragments (less than 2% gravel). The second or lower material is reddish brown, compact, extremely slowly permeable, sandy clay loam to clay loam (or even possibly silty clay loam) and contains about 5–25% coarse fragments of soft sandstone. These soils usually occupy crests and upper slope positions in an undulating to almost level landscape and typically are found near the coast.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c,d	severe — depth to compact layer; extremely slowly permeable	4D
		e	severe — depth to compact layer; extremely slowly permeable; slope	4DT
Vegetable crops		a,b,c	severe — depth to compact layer; extremely slowly permeable	
		d, part of e	severe — depth to compact layer; extremely slowly permeable; slope	
Septic tanks		all units	severe — extremely slowly permeable subsoil	
Housing	with basement	a,b,c,d	moderate — seasonal wetness; potential frost damage	
		e	moderate — seasonal wetness; potential frost damage; slope	
	without basement	a,b,c,d	moderate — potential frost damage	
		e	moderate — potential frost damage; slope	
Sanitary landfill (area-type)		a,b,c,d	moderate — seasonal wetness; possibly subsoil texture	
		e	moderate — seasonal wetness; slope; possibly subsoil texture	
Local roads and streets		a,b,c	moderate — seasonal wetness; subgrade suitability; potential frost damage	
		d,e	moderate — seasonal wetness; subgrade suitability; potential frost damage; slope	
Athletic fields		a,b	moderate — potential frost damage; surface texture if loamy sand	
		c	moderate — potential frost damage; slope; surface texture if loamy sand	
		d	severe — slope	
		e	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c	slight to none — few or no adverse conditions (downgrade if loamy sand surface texture)	
		d	moderate — slope; surface texture if loamy sand	
		e	severe — slope	
	picnic areas	a,b,c,d	slight to none — few or no adverse conditions (downgrade if loamy sand surface texture)	
		e	moderate — slope	

Note: These soils are shallow phases (20–50 cm to glacial till) of the well to moderately well drained member of the Richibucto association.

Soil unit: BA2

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	a,b,c d,e	slight to none moderate	Erosion hazards	a,b,c d,e	slight to none moderate
Equipment limitations	a,b,c,d e	slight to none moderate	Windthrow hazards	all units	moderate
Species suitability	black spruce, balsam fir, white spruce,* white birch, sugar maple,* beech		Capability class	4^{D}_{T} bs	

*Species of limited suitability.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair (poor if loamy sand)	poor	unsuitable	fair

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	extremely slowly permeable subsoil; d-slopes and greater may affect storage capacity
Pond embankment	subsoil has medium to low shear strength, low to medium compressibility, low compacted permeability, fair to good compaction characteristics, 5–25% coarse fragments of soft sandstone
Drainage	usually not needed but speeds up drying out in the spring; 20–50 cm of rapidly permeable material over an extremely slowly permeable subsoil
Sprinkler irrigation	20–50 cm of rapidly permeable material over an extremely slowly permeable subsoil; very good infiltration rate; fair water-holding capacity
Road location	subsoil is potentially erodible; potential frost damage; cuts and fill are necessary on d-slopes

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–35	1.20–1.40	—	—	<2	75–95	5–15	2–10	>25.0	0.10–0.15	4.0–5.0
35+	1.70–2.00	SM–SC to CL	A–4 to A–6	5–25	30–50	25–40	25–40	<0.1	<0.10	4.0–5.0

Soil units: BA3, BA4, BA5 **Area: 3568 ha**

Description of soil

These are predominantly imperfectly drained, deep, acid soils, low in natural fertility, which have formed in a moderately thin surficial mantle of glacial marine-deposited sandy material derived mainly from gray green sandstone over a fine to clayey textured glacial till derived mainly from red shale and gray green sandstone. The upper material is olive brown, loose, rapidly permeable loamy sand to sandy loam material, 20–50 cm thick and free of coarse fragments (less than 2% gravel). The second or lower material is a reddish brown compact, extremely slowly permeable, sandy clay loam to clay loam (or even possibly silty clay loam) and contains about 10–20% coarse fragments of soft sandstone. These soils usually occupy areas on the edges of depressions and middle to lower slope positions in an undulating to almost level landscape and typically are found near the coast.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c,d	severe — depth to compact layer; extremely slowly permeable; seasonal wetness	
		e	severe — depth to compact layer; extremely slowly permeable; seasonal wetness; slope	4DW
Vegetable crops		all units	severe — depth to compact layer; extremely slowly permeable subsoil; seasonal wetness	
Septic tanks		all units	severe — extremely slowly permeable; seasonal wetness	
Housing	with basement	all units	severe — seasonal wetness	
	without basement	a,b,c,d	moderate — seasonal wetness; potential frost damage	
		e	moderate — seasonal wetness; potential frost damage; slope	
Sanitary landfill (area-type)		all units	moderate — seasonal wetness; possibly subsoil texture	
Local roads and streets		a,b,c	moderate — seasonal wetness; subgrade suitability; potential frost damage	
		d,e	moderate — seasonal wetness; slope; subgrade suitability; potential frost damage	
Athletic fields		a,b	moderate — seasonal wetness; potential frost damage; surface texture if loamy sand	
		c	moderate — seasonal wetness; potential frost damage; slope; surface texture if loamy sand	
		d	severe — slope	
		e	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c	moderate — seasonal wetness; surface texture if loamy sand	
		d	moderate — seasonal wetness; slope; surface texture if loamy sand	
		e	severe — slope	
	picnic areas	a,b,c,d	moderate — seasonal wetness; surface texture if loamy sand	
		e	moderate — seasonal wetness; slope; surface texture if loamy sand	

Note: These soils are shallow phases (20–50 cm to glacial till) of the imperfectly drained member of the Richibucto association.

Soil units: BA3, BA4, BA5

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	moderate	Erosion hazards	a,b,c d,e	slight to none moderate
Equipment limitations	all units	moderate	Windthrow hazards	all units	moderate
Species suitability	black spruce, balsam, fir, yellow birch, white spruce*		Capability class	BA3, BA4 – 4^{D}_{W} bs	BA5 – 5^{W}_{D} bs

*Species of limited suitability.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair (poor if loamy sand)	poor	unsuitable	fair

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	extremely slowly permeable subsoil
Pond embankment	subsoil has medium to low shear strength, low to medium compressibility, low compacted permeability, fair to good compaction characteristics, 5–25% coarse fragments of soft sandstone
Drainage	seasonal wetness, 20–50 cm of an extremely slowly permeable layer; stones in subsoil may hinder tile laying
Sprinkler irrigation	seasonal wetness; needs drainage first
Road location	subsoil is potentially erodible; potential frost damage; seasonal wetness

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–35	1.20–1.40	—	—	<2	75–95	5–15	2–10	>25.0	0.10–0.15	4.0–5.0
35+	1.70–2.00	SM–SC to CL	A–4 to A–6	5–25	30–50	25–40	25–40	<0.1	<0.10	4.0–5.0

Soil units: BA6, BA7 **Area: 18 636 ha**

Description of soil

These are predominantly poorly drained, deep, acid soils, low in natural fertility, which have formed in a moderately thin surficial mantle of glacial marine-deposited sandy material derived mainly from gray green sandstone over a fine to clayey textured glacial till derived mainly from red shale and gray green sandstone. The upper material is olive brown, loose, rapidly permeable, loamy sand to sandy loam material 20–50 cm thick and free of coarse fragments (less than 2% gravel). The second or lower material is reddish brown, compact, extremely slowly permeable, sandy clay loam to clay loam (or even possibly silty clay loam) and contains about 10–20% coarse fragments of soft sandstone. These soils, usually occupy depressions and lower slope positions in an almost level to undulating landscape and typically are found near the coast.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	unsuitable — depth to compact layer; extremely slowly permeable; excessive wetness	5WD
Vegetable crops		all units	unsuitable — depth to compact layer; extremely slowly permeable; excessive wetness	
Septic tanks		all units	severe — extremely slowly permeable; prolonged wetness	
Housing	with basement	all units	severe — prolonged wetness; potential frost damage	
	without basement	all units	severe — prolonged wetness; potential frost damage	
Sanitary landfill (area-type)		all units	moderate — prolonged wetness; possibly subsoil texture	
Local roads and streets		all units	severe — prolonged wetness; potential frost damage	
Athletic fields		a,b,c	severe — prolonged wetness; potential frost damage	
		d	severe — prolonged wetness; slope; potential frost damage	
		e	unsuitable — slope	
Outdoor living	tent and trailer parks	all units	severe — prolonged wetness	
	picnic areas	all units	severe — prolonged wetness	

Note: These soils are shallow phases (20–50 cm to glacial till) of the poorly drained member of the Richibucto association.

Soil units: BA6, BA7

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe	Erosion hazards	all units	slight to none
Equipment limitations	all units	moderate (severe)	Windthrow hazards	all units	moderate–severe
Species suitability	black spruce, balsam fir		Capability class	BA6 – $\frac{5W}{bs}$	BA7 – $\frac{6W}{bs}$

*Note: Parentheses indicate seasonal variation.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair (poor if loamy sand)	poor	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	prolonged wetness; extremely slowly permeable subsoil
Pond embankment	subsoil has medium to low shear strength, low to medium compressibility, low compacted permeability, fair to good compaction characteristics, 5–25% coarse fragments of soft sandstone
Drainage	prolonged wetness; 20–50 cm to an extremely slowly permeable layer; stones in subsoil may interfere with tile laying; outlets difficult to find
Sprinkler irrigation	prolonged wetness; needs drainage first
Road location	prolonged wetness; potentially erodible subsoil; potential severe frost damage

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–35	1.20–1.40	—	—	<2	75–95	5–15	2–10	>25.0	0.10–0.15	4.0–5.0
35+	1.70–2.00	SM–SC to CL	A–4 to A–6	5–25	30–50	25–40	25–40	<0.1	<0.10	4.0–5.0

Soil unit: BA8 **Area: 4471 ha**

Description of soil

These are predominantly very poorly drained, deep, acid soils, low in natural fertility, which have formed in a moderately thin surficial mantle of glacial marine-deposited sandy material derived mainly from gray green sandstone over a fine to clayey textured glacial till derived mainly from red shale and gray green sandstone. The upper material is olive brown, loose, rapidly permeable loamy sand to sandy loam material 20–50 cm thick and free of coarse fragments (less than 2% gravel). The second or lower material is reddish brown, compact, extremely slowly permeable, sandy clay loam to clay loam (or even possibly silty clay loam) and contains about 10–20% coarse fragments of soft sandstone. These soils usually occupy depressions or lower slope positions in an almost level to slight undulating landscape and typically are found near the coast.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	unsuitable — permanently wet	7W
Vegetable crops		all units	unsuitable — permanently wet	
Septic tanks		all units	unsuitable — permanently wet	
Housing	with basement	all units	unsuitable — permanently wet	
	without basement	all units	unsuitable — permanently wet	
Sanitary landfill (area-type)		all units	severe — permanently wet	
Local roads and streets		all units	severe — permanently wet; potential frost damage	
Athletic fields		all units	unsuitable — permanently wet	
Outdoor living	tent and trailer parks	all units	unsuitable — permanently wet	
	picnic areas	all units	unsuitable — permanently wet	

Note: These soils are shallow phases (20–50 cm to glacial till) of the poorly drained member of the Richibucto association.

Soil unit: BA8

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe	Erosion hazards	all units	slight to none
Equipment limitations	all units	severe	Windthrow hazards	all units	severe
Species suitability	black spruce,* balsam fir*		Capability class	6W bs	

*Species of limited suitability.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
unsuitable	poor	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	permanently wet: extremely slowly permeable subsoil
Pond embankment	subsoil has medium to low shear strength, low to medium compressibility, low compacted permeability, fair to good compaction characteristics, 5–25% coarse fragments of soft sandstone
Drainage	permanently wet: 20–50 cm to an extremely slowly permeable layer; stones in subsoil may hinder tile laying; outlets difficult to find
Sprinkler irrigation	permanently wet: needs drainage first
Road location	permanently wet; potentially erodible subsoil; potential severe frost damage

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–35	1.20–1.40	—	—	<2	70–95	5–15	2–10	>25.0	0.10–0.15	4.0–5.0
35+	1.70–2.00	SM–SC to CL	A–4 to A–6	5–25	30–50	25–40	25–40	<0.1	<0.10	4.0–5.0

Big Hole Association

Soil units: BH1, BH2 Area: 2523 ha

Description of soil

These are predominantly well to rapidly drained, shallow, yellowish brown, acid, coarse-textured soils, low in natural fertility, which have formed in thin deposits of loose till derived mainly from gray green sandstone, over a soft, easily split, Pennsylvanian sandstone bedrock. Total thickness of the soil over bedrock is 10–50 cm, of which the entire depth consists of a relatively loose, permeable to rapidly permeable sandy loam to loamy sand material. The surface soil usually lies directly on the bedrock. Coarse fragments of flat, platy, soft sandstone range from 10 to 40%, usually increasing in abundance with depth, being particularly abundant immediately over the bedrock contact. Surface stones are common. These soils usually occupy crests and upper slope positions in an undulating to gently rolling landscape. They are also commonly found along stream and river courses.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c,d,e	unsuitable — depth to bedrock moderate fertility, droughtiness, and subsurface stoniness problems	5RPM
		f	unsuitable — slope	7T
Vegetable crops		all units	unsuitable — depth to bedrock; combined with surface coarse fragments, droughtiness, and fertility (slopes over 12%)	
Septic tanks		all units	unsuitable — depth to bedrock (permeability rates very severe)	
Housing	with basement	a,b,c,d	moderate — depth to bedrock	
		e	moderate — slope; depth to bedrock	
		f	severe — slope	
	without basement	a,b,c,d	moderate — depth to bedrock	
		e	moderate — slope; depth to bedrock	
		f	severe — slope	
Sanitary landfill (area-type)		all units	unsuitable — depth to bedrock (permeability rates severe)	
Local roads and streets		a,b,c	moderate — depth to bedrock	
		d,e	moderate — slope; depth to bedrock	
		f	severe or unsuitable — slope	
Athletic fields		a b	moderate — depth to bedrock; moisture deficiency; surface coarse fragments	
		c	severe — depth to bedrock	
		d	severe — slope; depth to bedrock	
		e,f	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c	moderate — moisture deficiency; depth to bedrock	
		d	moderate — slope; moisture deficiency; depth to bedrock	
		e	severe — slope	
		f	unsuitable — slope	
	picnic areas	a,b,c,d	moderate — moisture deficiency; depth to bedrock	
		e	moderate — slope; moisture deficiency; depth to bedrock	
		f	severe — slope	

Note: These soils are shallow phases (10–50 cm to bedrock) of the well to rapidly drained member of the Sunbury association.

Soil units: BH1, BH2

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	a,b,c d,e f	slight to none moderate severe	Erosion hazards	a,b,c d,e f	slight to none moderate severe
Equipment limitations	a,b,c,d e,f	slight to none moderate	Windthrow hazards	all units	moderate
Species suitability	jack pine, red pine, black spruce, eastern white pine,* white birch,* beech		Capability class	4^{1}_{51} jp	

*Species of limited suitability.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
poor (max. slope 15%)	unsuitable	unsuitable	good

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	10–50 cm of permeable soil over a bedrock that is readily permeable in the surface 1 m but extremely slowly permeable below
Pond embankment	very little soil material — no subsoil, all surface soil: high to medium compacted permeability: 10–40% coarse fragments
Drainage	not needed; permeable soil
Sprinkler irrigation	fair water-holding capacity; very good infiltration rate: 10–50 cm of permeable soil to a bedrock that is readily permeable in the upper 1 m but extremely slowly permeable below
Road location	10–50 cm to soft, easily split sandstone bedrock: may be stony; cuts and fill necessary on d-slopes and steeper

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–35	1.00–0.15	—	—	10–40	50–75	20–40	7–14	>20.0	0.10–0.15	4.0–5.0
35+	soft, rippable, Pennsylvanian, sandstone bedrock									

Soil units: BH3, BH4, BH5 Area: 346 ha

Description of soil

These are predominantly imperfectly drained, shallow, yellowish brown, acid, coarse-textured soils, low in natural fertility, which have formed in thin deposits of loose till derived mainly from gray green sandstone, over a soft, easily split Pennsylvanian sandstone bedrock. Total thickness of the soil over bedrock is 10–50 cm, of which the entire depth consists of a relatively loose, permeable to rapidly permeable sandy loam to loamy sand material. The surface soil usually lies directly on the bedrock. Coarse fragments of flat, platy soft sandstone range from 10 to 40% usually increasing in abundance with depth, being particularly abundant immediately over the bedrock contact. Surface stones are common. These soils usually occupy areas on the edges of depressions and middle to lower slope positions in an undulating to gently rolling landscape. They are also commonly found along stream and river courses.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	unsuitable — depth to bedrock; moderate fertility, subsurface stoniness, and seasonal wetness problems	5RWP
Vegetable crops		all units	unsuitable — depth to bedrock; surface coarse fragments, fertility, and seasonal wetness	
Septic tanks		all units	unsuitable — shallowness to bedrock (seasonal wetness rates severe)	
Housing	with basement	a,b,c,d	severe — seasonal wetness	
	without basement	a,b,c,d	moderate — seasonal wetness; depth to bedrock	
		e	moderate — seasonal wetness; slope; depth to bedrock	
Sanitary landfill (area-type)		all units	unsuitable — depth to bedrock (permeability and seasonal wetness rate severe)	
Local roads and streets		a,b,c	moderate — seasonal wetness; depth to bedrock	
		d,e	moderate — seasonal wetness; slope; depth to bedrock	
Athletic fields		a,b	moderate — seasonal wetness; depth to bedrock; surface coarse fragments	
		c	severe — depth to bedrock	
		d	severe — slope; depth to bedrock	
		e	unsuitable — slope	
Outdoor living	trailer parks	a,b,c	moderate — seasonal wetness; depth to bedrock	
		d	moderate — seasonal wetness; slope; depth to bedrock	
		e	severe — slope	
	picnicking and tenting	a,b,c,d	moderate — seasonal wetness; depth to bedrock	
		e	moderate — seasonal wetness; slope; depth to bedrock	

Note: These soils are shallow phases (10–50 cm to bedrock) of the imperfectly drained members of the Sunbury association.

Soil units: BH3, BH4, BH5

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	a,b,c d,e	slight to none moderate	Erosion hazards	a,b,c d,e	slight to none moderate
Equipment limitations	a,b,c,d e	slight to none moderate	Windthrow hazards	all units	moderate
Species suitability	jack pine, red pine, black spruce, balsam fir, eastern white pine*		Capability class	BH3 – 4^{t}_{R}, jp	BH4, BH5 – 4^{t}_{w} bs

*Species of limited suitability.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
poor (max. slope 15%)	unsuitable	unsuitable	fair

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	10–50 cm of permeable soil over a bedrock that is readily permeable in the surface 1 m but very slowly permeable below; seasonal wetness
Pond embankment	very little soil material — no subsoil; only surface soil; high to medium compacted permeability; 10–40% coarse fragments
Drainage	seasonal wetness; shallowness to bedrock affects tile installation
Sprinkler irrigation	seasonal wetness — irrigation usually not needed, but good infiltration rate and fair water-holding capacity
Road location	10–50 cm to soft easily split sandstone bedrock; cuts and fill necessary on d-slopes and steeper, seasonal wetness

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–35	1.00–1.15	—	—	10–40	50–75	20–40	7–14	>20.0	0.10–0.15	4.0–5.0
35+	soft, easily split, Pennsylvanian sandstone bedrock									

Buctouche Association

Soil units: BUI, BU2 **Area: 1510 ha**

Description of soil

These are predominantly rapidly drained, deep, acid soils, low in natural fertility, which have formed in a moderately thick surficial mantle of glacial marine-deposited sandy material derived mainly from gray green sandstone over a fine to clayey textured glacial till derived mainly from red shale and gray green sandstone. The upper material is olive brown, loose, rapidly permeable, sand to sandy loam material 50–100 cm thick and free of coarse fragments (less than 2% gravel). The second or lower material is reddish brown, compact, extremely slowly permeable, sandy clay loam to clay loam (or even possibly silty clay loam) and contains about 10–20% coarse fragments of soft sandstone. These soils usually occupy crests and upper slope positions in an undulating to nearly level landscape and typically are found near the coast.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c,d	severe — droughtiness;[1] fertility	4MF
		e	severe — droughtiness;[1] fertility; slope	4MT
Vegetable crops		a,b,c	severe — droughtiness;[1] fertility	
		d, part of e	severe — droughtiness;[1] fertility; slope	
Septic tanks		all units	severe — rapidly permeable material over extremely slowly permeable material	
Housing	with basement	a,b,c,d	moderate — potential frost damage	
		e	moderate — potential frost damage; slope	
	without basement	a,b,c,d	slight to none — few or no adverse conditions	
		e	moderate — slope	
Sanitary landfill (area-type)		a,b,c,d	moderate — subsoil texture (upgrade if sandy clay loam)	
		e	moderate — subsoil texture; slope	
Local roads and streets		a,b,c	moderate — subgrade suitability; potential frost damage	
		d,e	moderate — subgrade suitability; potential frost damage; slope	
Athletic fields		a,b,c	severe — droughtiness[1] (potential frost damage)	
		d	severe — slope; droughtiness;[1] (potential frost damage)	
		e	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c,d	severe — droughtiness[1]	
		e	severe — droughtiness;[1] slope	
	picnic areas	all units	severe — droughtiness[1]	

Note: These soils are moderately deep phases (50–100 cm to glacial till) of the rapidly drained member of the Richibucto association.

[1]Droughtiness may not be a severe problem where plowing has incorporated sufficient organic matter into the surface soil to increase water-holding capacity.

Soil units: BU1, BU2

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	a,b,c d,e	slight to none moderate	Erosion hazards	a,b,c d,e	slight to none moderate
Equipment limitations	a,b,c,d e	slight to none moderate	Windthrow hazards	all units	slight to none
Species suitability	jack pine, red pine, eastern white pine, black spruce		Capability class	$\frac{4^{1}_{M}}{ip}$	

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair (poor if loamy sand)	fair	unsuitable	fair to good

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	50–100 cm of rapidly sandy material over an extremely slowly permeable compact material; d-slope may affect storage
Pond embankment	surface 50–100 cm is rapidly permeable but the material below has low compacted permeability; low to medium compressibility; medium to low strength; fair to good compaction characteristics may require stone removal
Drainage	not needed
Sprinkler irrigation	surface material (50–100 cm) has a very good infiltration rate a very low water-holding capacity; lower material is extremely slowly permeable
Road location	50–100 cm of sandy material over a fine-textured compact material that is potentially erodible and susceptible to frost damage; cuts and fill necessary on d-slope and steeper

Some physical and chemical properties

Depth cm	Bulk density	Unified class	AASHO class	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm cm/hr	Available water cm/cm	pH (H_2O)
0–40	1.20–1.40	—	—	<2	70–95	5–15	2–10	>25.0	0.08–0.12	4.0–5.0
40–75	1.40–1.55	SP	A–3	<2	85–95	2–10	2–5	>25.0	<0.10	4.0–5.0
75+	1.70–2.00	SM–SC to CL	A–4 to A–6	5–25	30–50	25–40	25–40	<0.1	<0.10	4.0–5.0

Soil units: BU3, BU4, BU5 **Area: 7304 ha**

Description of soil

These are predominantly imperfectly drained, deep, acid soils, low in natural fertility, which have formed in a moderately thick surficial mantle of glacial marine-deposited sandy material derived mainly from gray green sandstone over a fine to clayey textured glacial till derived mainly from red shale and gray green sandstone. The upper material is olive brown, loose, rapidly permeable, sand to sandy loam material 50–100 cm thick and free of coarse fragments (less than 2%). The second or lower material is reddish brown, compact, extremely slowly permeable, sandy clay loam to clay loam (or even possibly silty clay loam) and contains about 10–20% coarse fragments of soft sandstone. These soils usually occupy areas on the edges of depressions and middle to lower slope positions in an undulating to almost level landscape and are typically found near the coast.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c,d	severe — fertility; seasonal wetness	4WF
		e	severe — fertility; seasonal wetness; slope	
Vegetable crops		a,b,c	severe — fertility; seasonal wetness	
		d, part of e	severe — fertility; seasonal wetness; slope	
Septic tanks		all units	severe — rapidly permeable material over extremely slowly permeable material; seasonal wetness	
Housing	with basement	all units	severe — seasonal wetness	
	without basement	a,b,c,d	moderate — seasonal wetness; potential frost damage	
		e	moderate — seasonal wetness; potential frost damage; slope	
Sanitary landfill (area-type)		all units	severe — seasonal wetness	
Local roads and streets		a,b,c	moderate — seasonal wetness; subgrade suitability; potential frost damage	
		d,e	moderate — seasonal wetness; subgrade suitability; potential frost damage; slope	
Athletic fields		a,b	moderate — seasonal wetness-droughtiness; surface texture if loamy sand	
		c	moderate — seasonal wetness-droughtiness; surface texture if loamy sand; slope (potential frost damage)	
		d	severe — slope	
		e	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c	moderate — seasonal wetness-droughtiness; surface texture if loamy sand	
		d	moderate — seasonal wetness-droughtiness; slope; surface texture if loamy sand	
		e	severe — slope	
	picnic areas	a,b,c,d	moderate — seasonal wetness-droughtiness; surface texture if loamy sand	
		e	moderate — seasonal wetness-droughtiness; surface texture if loamy sand; slope	

Note: These soils are moderately deep phases (50–100 cm to glacial till) of the imperfectly drained member of the Richibucto association.

Soil units: BU3, BU4, BU5

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	moderate	Erosion hazards	a,b,c d,e	slight to none moderate
Equipment limitations	all units	moderate	Windthrow hazards	all units	slight to none
Species suitability	jack pine, red pine, eastern white pine, black spruce, balsam fir		Capability class	BU3, BU4 – $4F_{jp}$ BU5 – $5F_{bs}^{w}$	

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair (poor if loamy sand)	fair	unsuitable	fair

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	50–100 cm of rapidly permeable sandy material over an extremely slowly permeable compact material; seasonal wetness
Pond embankment	surface 50–100 cm is rapidly permeable but the material below has a low compacted permeability; low to medium compressibility; medium to low shear strength; fair to good compaction characteristics may require stone removal
Drainage	seasonal wetness; rapidly permeable surface 50–100 cm but extremely slowly permeable below
Sprinkler irrigation	seasonal wetness; requires drainage first; very good infiltration rate but very low water-holding capacity; 50–100 cm to extremely slowly permeable layer
Road location	50–100 cm of sandy material over a fine-textured compact material that is potentially erodible and susceptible to frost damage; seasonal wetness

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	1.20–1.40	—	—	<2	70–95	5–15	2–10	>25.0	0.08–0.12	4.0–5.0
40–75	1.40–1.55	SP	A–3	<2	85–95	2–10	2–5	>25.0	<0.10	4.0–5.0
75+	1.70–2.00	SM–SC to CL	A–4 to A–6	5–25	30–50	25–40	25–40	<0.1	<1.10	4.0–5.0

Soil units: BU6, BU7 Area: 7795 ha

Description of soil

These are predominantly poorly drained, deep, acid soils, low in natural fertility, which have formed in a moderately thick surficial mantle of glacial marine-deposited sandy material derived mainly from gray green sandstone over a fine to clayey textured glacial till derived mainly from red shale and gray green sandstone. The upper material is olive brown, loose rapidly permeable, sand to sandy loam material 50–100 cm thick and free of coarse fragments (less than 2% gravel). The second or lower material is reddish brown, compact extremely slowly permeable, sandy clay loam to clay loam (or even possibly silty clay loam) and contains about 5–25% coarse fragments of soft sandstone. These soils usually occupy depressions and lower slope positions in an almost level to undulating landscape and are typically found near the coast.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	unsuitable — excessive wetness; fertility	5WF
Vegetable crops		all units	unsuitable — excessive wetness; fertility	
Septic tanks		all units	severe — prolonged wetness; subsoil permeability	
Housing	with basement	all units	severe (BU6) or unsuitable (BU7) — prolonged wetness	
	without basement	all units	severe — prolonged wetness	
Sanitary landfill (area-type)		all units	severe — prolonged wetness	
Local roads and streets		all units	severe — prolonged wetness	
Athletic fields		all units	severe — prolonged wetness	
Outdoor living	tent and trailer parks	all units	severe — prolonged wetness	
	picnic areas	all units	severe — prolonged wetness	

Note: These soils are moderately deep phases (50–100 cm to glacial till) of the poorly drained member of the Richibucto association

Soil units: BU6, BU7

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe	Erosion hazards	all units	slight to none
Equipment limitations	all units	moderate (severe)	Windthrow hazards	all units	moderate
Species suitability	black spruce, balsam fir		Capability	BU6 - 5W bs	BU7 - 6W bs

*Note: Parentheses indicate seasonal variation.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair (poor if loamy sand)	poor	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	50–100 cm of rapidly permeable material over a compact extremely slowly permeable layer; prolonged wetness
Pond embankment	upper 50–100 cm is rapidly permeable but the material below has a low compacted permeability, medium to low shear strength, low to medium compressibility, fair to good compaction characteristics, may require stone removal
Drainage	prolonged wetness; rapidly permeable surface 50–100 cm but extremely slowly permeable below; outlets may be difficult to find
Sprinkler irrigation	prolonged wetness; requires drainage first; very good infiltration rate but very low water-holding capacity
Road location	prolonged wetness; 50–100 cm of sandy material over a fine-textured compact material that is potentially erodible and susceptible to frost damage

Some physical and chemical properties

Depth cm	Bulk density	Unified class	AASHO class	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm cm/hr	Available water cm/cm	pH (H2O)
0–3	1.20–1.40	—	—	<2	70–95	5–15	2–10	>25.0	0.08–0.12	4.0–5.0
30–75	1.40–1.55	SP	A–3	<2	85–95	2–10	2–5	>25.0	<0.10	4.0–5.0
75+	1.70–2.00	SM–SC to CL	A–4 to A–6	5–25	30–90	25–40	25–40	<0.1	<1.10	4.0–5.0

Caraquet Association

Soil units: CR1, CR2 **Area:** 550 ha

Description of soil

These are predominantly rapidly and well drained, deep, acid soils, very low to low in natural fertility, which have formed in a moderately thick surficial mantle of glacial marine-deposited sandy material derived mainly from gray green sandstone over a clayey textured marine-deposited material derived mainly from brown shale. The upper material is olive brown, loose, rapidly permeable, sand to sandy loam 50–100 cm thick and free of coarse fragments. The second or lower material is yellowish brown, compact, extremely slowly permeable silty clay loam and is also free of coarse fragments, except for possible sandstone gravel fragments. These soils usually occupy crests and upper slope positions in an undulating to almost level landscape and typically are found near the coast.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c,d	severe — droughtiness;[1] fertility	4MF
		e	severe — droughtiness;[1] fertility; slope	
Vegetable crops		a,b,c	severe — droughtiness;[1] fertility	
		d, part of e	severe — droughtiness;[1] fertility; slope	
Septic tanks		all units	severe — rapidly permeable material over an extremely slowly permeable subsoil	
Housing	with basement	a,b,c,d	moderate — potential frost damage; potential shrink-swell	
		e	moderate — potential frost damage; slope; potential shrink-swell	
	without basement	a,b,c,d	moderate — potential frost damage; potential shrink-swell	
		e	moderate — potential frost damage; potential shrink-swell; slope	
Sanitary landfill (area-type)		a,b,c,d	moderate — subsoil texture	
		e	moderate — subsoil texture; slope	
Local roads and streets		a,b,c	moderate — subgrade suitability; shrink-swell potential; potential frost damage	
		e	moderate — subgrade suitability; shrink-swell potential; potential frost damage; slope	
Athletic fields		a,b,c	severe — droughtiness[1] (potential frost damage)	
		e	severe — droughtiness;[1] slope (potential frost damage)	
			unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c,d	moderate — droughtiness[1]	
		e	moderate — droughtiness;[1] slope	
	picnic areas	all units	moderate — droughtiness[1]	

Note: These soils are moderately deep phases (50–100 cm to marine clay) of the rapidly drained member of the Richibucto association.

[1]Droughtiness may not be a severe problem where plowing has incorporated sufficient organic matter into the surface soil to increase water-holding capacity.

Soil units: CR1, CR2

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	a,b,c d,e	slight to none moderate	Erosion hazards	a,b,c d e	slight to none moderate severe
Equipment limitations	a,b,c,d e	slight to none moderate	Windthrow hazards	all units	slight to none
Species suitability	jack pine, red pine, eastern white pine, black spruce		Capability class	4^{M}_{F} jp	

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair if sandy loam poor if loamy sand	fair	unsuitable	fair

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	50–100 cm of rapidly permeable sandy material over an extremely slowly permeable compact material; d-slopes may offer storage capacity
Pond embankment	surface 50–100 cm is rapidly permeable but the material below has low compacted permeability and fair to good compaction characteristics; however a moderate shrink-swell potential
Drainage	not needed
Sprinkler irrigation	surface 50–100 cm has a very good infiltration rate but a very low water-holding capacity; lower material is extremely slowly permeable
Road location	50–100 cm of sandy material over a clayey textured compact subsoil that is potentially erodible and susceptible to frost damage; cuts and fill necessary on d-slopes and steeper; trafficability could be a problem

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	1.20–1.40	—	—	<1%	70–95	5–15	2–10	>25.0	0.08–0.12	4.0–5.0
40–75	1.40–1.55	SP	A–3	<1%	85–95	2–10	2–5	>25.0	<0.10	4.0–5.0
75+	1.70–1.90	ML–CL	A–4 A–7	<1%	2–10	45–65	30–45	<0.1	<0.10	5.0–5.5

Soil units: CR3, CR4, CR5 Area: 1863 ha

Description of soil

These are predominantly imperfectly drained, deep, acid soils, very low to low in natural fertility, which have formed in a moderately thick surficial mantle of glacial marine-deposited sandy material derived mainly from gray green sandstone over a clayey textured marine-deposited material derived mainly from brown shale. The upper material is olive brown, loose, rapidly permeable, sand to sandy loam 50–100 cm thick and free of coarse fragments. The second or lower material is yellowish brown, compact, extremely slowly permeable silty clay loam and is also free of coarse fragments except for possibly some sandstone gravel fragments. These soils usually occupy areas on the edges of depressions and middle to lower slope position in an undulating to almost level landscape and are typically found near the coast.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c,d	severe — fertility; seasonal wetness	4DW
		e	severe — fertility; seasonal wetness; slope	
Vegetable crops		a,b,c	severe — fertility; seasonal wetness	
		d, part of e	severe — fertility; seasonal wetness; slope	
Septic tanks		all units	severe — rapidly permeable material over extremely slowly permeable material; seasonal wetness	
Housing	with basement	all units	severe — seasonal wetness	
			moderate — seasonal wetness; potential frost damage; potential shrink-swell	
	without basement	a,b,c,d		
		e	moderate — seasonal wetness; potential frost damage; slope potential shrink-swell	
Sanitary landfill (area-type)		all units	severe — seasonal wetness	
Local roads		a,b,c	moderate — seasonal wetness; subgrade suitability; shrink-swell potential; potential frost damage	
		d,e	moderate — seasonal wetness; subgrade suitability; shrink-swell potential; potential frost damage; slope	
Athletic fields		a,b	moderate — seasonal wetness-droughtiness; surface texture if loamy sand	
		c	moderate — seasonal wetness-droughtiness; surface texture if loamy sand; slope; potential frost damage	
		d	severe — slope	
		e	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c	moderate — seasonal wetness-droughtiness; surface texture if loamy sand	
		d	moderate — seasonal wetness-droughtiness; surface texture if sand; slope	
		e	severe — slope	
	picnic areas	a,b,c,d	moderate — seasonal wetness-droughtiness; surface texture if loamy sand	
		e	moderate — seasonal wetness-droughtiness; surface texture if loamy sand; slope	

Note: These soils are moderately deep phases (50–100 cm to marine clay) of the imperfectly drained member of the Richibucto association.

Soil units: CR3, CR4, CR5

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	moderate	Erosion hazards	a,b,c d e	slight to none moderate severe
Equipment limitations	all units	moderate	Windthrow hazards	all units	slight to none
Species suitability	jack pine, red pine, eastern white pine		Capability class	CR3, CR4 – 4^{j}_{jp}	CR5 – 4^{w}_{bs}

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair (poor if loamy sand)	fair	unsuitable	fair

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	50–100 cm of rapidly permeable sandy material over an extremely slowly permeable compacted subsoil; seasonal wetness
Pond embankment	surface 50–100 cm is rapidly permeable but the material below has a low compacted permeability and fair to good compaction characteristics; moderate shrink-swell potential
Drainage	seasonal wetness; rapidly permeable surface 50–100 cm but extremely slowly permeable below
Sprinkler irrigation	seasonal wetness; requires drainage first; very good infiltration rate but very low water-holding capacity; 50–100 cm to extremely slowly permeable layer
Road location	50–100 cm of sandy material over a clayey textured compact material that is potentially erodible and susceptible to frost damage; seasonal wetness; trafficability could be a problem

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	1.20–1.40	—	—	<1%	75–95	5–15	2–10	>25.0	0.08–0.12	4.0–5.0
40–75	1.40–1.55	SP	A–3	<1%	85–95	2–10	2–5	>25.0	<0.10	4.0–5.0
75+	1.70–1.90	ML–CL	A–4 A–7	<1%	2–10	45–65	30–45	<0.1	<0.10	5.0–5.5

Soil units: CR6, CR7 Area: 3532 ha

Description of soil

These are predominantly poorly drained, deep, acid soils, very low to low in natural fertility, which have formed in a moderately thick surficial mantle of glacial marine-deposited sandy material derived mainly from gray green sandstone over a clayey textured marine-deposited material derived mainly from brown shale. The upper material is olive brown, loose, rapidly permeable, sand to sandy loam 50–100 cm thick and free of coarse fragments. The second or lower material is yellowish brown, compact, extremely slowly permeable silty clay loam and is also free of coarse fragments, except for possibly some sandstone gravel fragments. These soils usually occupy depressions and lower slope positions in an almost level to undulating landscape and are typically found near the coast.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	unsuitable — excessive wetness; fertility	5WD
Vegetable crops		all units	unsuitable — excessive wetness; fertility	
Septic tanks		all units	severe — prolonged wetness; subsoil permeability	
Housing	with basement	all units	severe (CR6) or unsuitable (CR7) — prolonged wetness	
	without basement	all units	severe — prolonged wetness	
Sanitary landfill (area-type)		all units	severe — prolonged wetness	
Local roads and streets		all units	severe — prolonged wetness	
Athletic fields		all units	severe — prolonged wetness	
Outdoor living	tent and trailer parks	all units	severe — prolonged wetness	
	picnic areas	all units	severe — prolonged wetness	

Note: These soils are moderately deep phases (50–100 cm to marine clay) of the poorly drained member of the Richibucto association.

Soil units: CR6, CR7

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe	Erosion hazards	all units	slight to none
Equipment limitations	all units	moderate-severe	Windthrow hazards	all units	moderate
Species suitability	black spruce, balsam fir		Capability class	CR6 – 5W bs	CR7 – 6W bs

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair (poor if loamy sand)	poor	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	50–100 cm of rapidly permeable material over a compact extremely slowly permeable subsoil: prolonged wetness
Pond embankment	upper 50–100 cm of soil is a rapidly permeable sandy material but below this the second material has medium to low shear strength; medium compressibility; low compacted permeability and fair to good compaction characteristics but a moderate shrink-swell potential
Drainage	prolonged wetness; rapidly permeable surface 50–100 cm but extremely slowly permeable subsoil; outlets may be difficult to find
Sprinkler irrigation	prolonged wetness; requires drainage first; very good infiltration rate but very low water-holding capacity
Road location	prolonged wetness; 50–100 cm of sandy material over a clayey textured compacted material that is potentially erodible and susceptible to frost damage; trafficability could be a problem

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–30	1.20–1.40	—	—	<1%	70–95	5–15	2–10	>25.0	<0.10	4.0–5.0
30–75	1.40–1.55	SP	A–3	<1%	85–95	2–10	2–5	>25.0	<0.10	4.0–5.0
75+	1.70–1.90	ML–CL	A–4 A–7	<1%	2–10	45–65	30–45	<0.1	<0.10	5.0–5.5

Fair Isle Association

Soil units: FA1, FA2 **Area: 3950 ha**

Description of soil

These are predominantly well to rapidly drained, moderately deep, yellowish brown, acid, coarse-textured soils, low in natural fertility, which have formed in deposits of loose till derived mainly from gray green sandstone, over a soft, easily split Pennsylvanian sandstone bedrock. Total thickness of the soil over bedrock is 50–100 cm of a relatively loose, permeable to rapidly permeable material that grades from a sandy loam surface texture into a loamy sand to sandy loam subsoil. Coarse fragments of flat, platy, soft sandstone, make up 10–40%, usually increasing in abundance with depth, being particularly abundant immediately over the bedrock contact. Surface stones are common. These soils usually occupy crests and upper slope positions in an undulating to gently rolling landscape. They are also commonly found along stream and river courses.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c,d,e	severe — combined effect of fertility, droughtiness, subsurface stones, and depth to bedrock	4PR
		f	unsuitable — slope	7T
Vegetable crops		a,b,c,d,e	severe — combined effect of fertility, droughtiness, surface coarse fragments, and depth to bedrock	
		f	unsuitable — slope	
Septic tanks		all units	severe — depth to bedrock	
Housing	with basement	a,b,c,d	moderate — depth to bedrock	
		e	moderate — slope; depth to bedrock	
		f	severe — slope	
	without basement	a,b,c,d	slight to none — few or no adverse conditions	
		e	moderate — slope	
		f	severe — slope	
Sanitary landfill (area-type)		all units	severe — subsoil permeability might result in groundwater contamination; depth to bedrock	
Local roads and streets		a,b,c	slight to none — few or no adverse conditions	
		d,e	moderate — slope	
		f	severe or unsuitable — slope	
Athletic fields		a,b	moderate — moisture deficiency; depth to bedrock; surface coarse fragments	
		c	moderate — slope; moisture deficiency; depth to bedrock; surface coarse fragments	
		d	severe — slope	
		e,f	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c	moderate — moisture deficiency	
		d	moderate — slope; moisture deficiency	
		e	severe — slope	
		f	unsuitable — slope	
	picnic areas	a,b,c,d	moderate — moisture deficiency	
		e	moderate — slope; moisture deficiency	
		f	severe — slope	

Note: These soils are moderately deep phases (50–100 cm to bedrock) of the well to rapidly drained member of the Sunbury association.

Soil units: FA1, FA2

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	a,b,c d,e f	slight to none moderate severe	Erosion hazards	a,b,c,d e,f	slight to none moderate
Equipment limitations	a,b,c,d e,f	slight to none moderate	Windthrow hazards	all units	slight to none
Species suitability	jack pine, red pine, eastern white pine, sugar maple,* beech, white birch, black spruce		Capability class	4^{t}_{w} tp	

*Species of limited suitability

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair to poor (max. 15% slope)	unsuitable	unsuitable	good

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	50–100 cm of permeable soil over bedrock that is readily permeable in the top metre, but extremely slowly permeable below
Pond embankment	subsoil has high to medium shear strength, low compressibility, high to medium compacted permeability, good to fair compaction characteristics, 20–45% coarse fragments of soft sandstone, limited quantity of subsoil
Drainage	not needed; permeable soil; bedrock readily permeable in the top metre
Sprinkler irrigation	fair water-holding capacity; very good infiltrating rate; permeable subsoil; 50–100 cm to bedrock that is readily permeable in the top metre, but extremely slowly permeable below
Road location	50–100 cm to soft easily split sandstone bedrock; may be stony; cuts and fill necessary on d-slopes and steeper

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	1.00–1.15	—	—	10–20	60–80	15–30	7–14	>20.0	0.10–0.15	4.0–5.0
40–75	1.45–1.70	GW–GM or SW–SM	A–1 or A–2	20–45	65–85	15–25	6–12	5.0–10.0	0.10–0.15	4.5–5.0
75+	soft, easily split, Pennsylvanian sandstone bedrock									

Soil units: FA3, FA4, FA5 **Area: 2712 ha**

Description of soil

These are predominantly imperfectly drained, moderately deep, yellowish brown, acid, coarse-textured soils, low in natural fertility, which have formed in deposits of loose till derived mainly from gray green sandstone over a soft, easily split Pennsylvanian sandstone bedrock. Total thickness of the soil over bedrock is 50–100 cm of a relatively loose, permeable to rapidly permeable material that grades from a sandy loam surface texture into a loamy sand to sandy loam subsoil. Coarse fragments of flat, platy, soft sandstone make up 10–40%, usually increasing in abundance with depth, being particularly abundant immediately over the bedrock contact. Surface stones are common. These soils usually occupy areas on the edges of depressions and middle to lower slope positions in an undulating to gently rolling landscape. They are also commonly found along stream and river courses.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	severe — combined effect of fertility, depth to bedrock, seasonal wetness, and subsurface coarse fragments	4PWR
Vegetable crops		a,b,c,d	severe — combined effect of fertility, depth to bedrock, surface coarse fragments, and seasonal wetness	
		e	unsuitable — slope	
Septic tanks		all units	severe — seasonal wetness, depth to bedrock	
Housing	with basement	a,b,c	severe — seasonal wetness	
		d,e	severe — seasonal wetness, slope	
	without basement	a,b,c,d	moderate — seasonal wetness	
		e	moderate — seasonal wetness, slope	
Sanitary landfill (area-type)		all units	severe — seasonal wetness and subsoil permeability or both might result in groundwater contamination; depth to bedrock	
Local roads and streets		a,b,c	moderate — seasonal wetness	
		d,e	moderate — seasonal wetness, slope	
Athletic fields		a,b	moderate — seasonal wetness, surface coarse fragments, depth to bedrock	
		c	moderate — seasonal wetness, slope, surface coarse fragments, depth to bedrock	
		d	severe — slope	
		e	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c	moderate — seasonal wetness	
		d	moderate — seasonal wetness, slope	
		e	severe — slope	
	picnic areas	a,b,c,d	moderate — seasonal wetness	
		e	moderate — seasonal wetness, slope	

Note: These soils are moderately deep phases (50–100 cm to bedrock) of the imperfectly drained member of the Sunbury association.

Soil units: FA3, FA4, FA5

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	a,b,c d,e	slight to none moderate	Erosion hazards	a,b,c,d e	slight to none moderate
Equipment limitations	a,b,c,d e	slight to none moderate	Windthrow hazards	all units	slight to none
Species suitability	jack pine, red pine, eastern white pine, black spruce, balsam fir, yellow birch		Capability class	FA3 4F tp	FA4, FA5 4^{t}_{a} bs

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair to poor (max. 15% slope)	unsuitable	unsuitable	fair

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	50–100 cm of permeable soil over a bedrock that is readily permeable in the top metre, but extremely slowly permeable below; seasonal wetness
Pond embankment	subsoil has high to medium shear strength, low compressibility, high to medium compacted permeability, good to fair compaction characteristics, 20–45% coarse fragments of soft sandstone, limited quantity of subsoil
Drainage	seasonal wetness; 50–100 cm of permeable soil over bedrock that is readily permeable in the top metre, but extremely slowly permeable below; stones and shallowness to bedrock may affect tile laying
Sprinkler irrigation	seasonal wetness (therefore irrigation usually not needed) but good infiltration rate, fair water-holding capacity, permeable subsoil, may be stony
Road location	50–100 cm to soft easily split sandstone bedrock, may be stony; cuts and fill necessary on d-slopes and steeper; seasonal wetness

Some physical and chemical properties

Depth cm	Bulk density	Unified class	AASHO class	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	1.00–1.15	—	—	10–20	60–80	15–30	7–14	>20.0	0.10–0.15	4.0–5.0
40–75	1.45–1.70	GW–GM or SW–SM	A–1 or A–2	10–45	65–85	15–25	6–12	5.0–10.0	0.10–0.15	4.5–5.0
75+	soft, easily split, Pennsylvanian sandstone bedrock									

Soil units: FA6, FA7 **Area: 321 ha**

Description of soil

These are predominantly poorly drained, moderately deep, yellowish brown, acid, coarse-textured soils, low in natural fertility, which have formed in deposits of loose till derived mainly from gray green sandstone, over a soft, easily split Pennsylvanian sandstone bedrock. Total thickness of the soil over bedrock is 50–100 cm of a relatively loose, permeable to rapidly permeable material that grades from a sandy loam surface texture into a loamy sand to sandy loam subsoil. Coarse fragments of flat, platy, soft sandstone make up 10–40%, usually increasing in abundance with depth, being particularly abundant immediately over the bedrock contact. Surface stones are common. These soils usually occupy depressions and lower slope positions in an undulating to gently rolling landscape.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	unsuitable — combined effect of fertility, depth to bedrock, excessive wetness	5WP
Vegetable crops		all units	unsuitable — combined effect of fertility, depth to bedrock excessive wetness, surface coarse fragments	
Septic tanks		all units	unsuitable — prolonged wetness combined with depth to bedrock and permeability of subsoil	
Housing	with basement	all units	severe — prolonged wetness	
	without basement	all units	severe — prolonged wetness	
Sanitary landfill (area-type)		all units	unsuitable — prolonged wetness (true groundwater table) combined with depth to bedrock and subsoil permeability	
Local roads and streets		all units	severe — prolonged wetness; possibly slope	
Athletic fields		a,b,c d	severe — prolonged wetness severe — prolonged wetness, slope	
Outdoor living	tent and trailer parks	all units	severe — prolonged wetness	
	picnic areas	all units	severe — prolonged wetness	

Note: These soils are moderately deep phases (50–100 cm to bedrock) of the poorly and very poorly drained member of the Sunbury association.

Soil units: FA6, FA7

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	moderate	Erosion hazards	all units	slight to none
Equipment limitations	all units	moderate	Windthrow hazards	all units	moderate
Species suitability	black spruce, balsam fir		Capability class	5W bs	

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
poor to fair (max. slope 15%)	unsuitable	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	prolonged wetness; 50–100 cm of permeable soil over bedrock that is readily permeable in the top metre, but is extremely slowly permeable below
Pond embankment	subsoil has high to medium shear strength, low compressibility, high to medium compacted permeability, good to fair compaction characteristics, 20–45% coarse fragments of soft sandstone, limited quantity of outlets
Drainage	prolonged wetness; 50–100 cm of permeable soil over bedrock that is readily permeable in the top meter, but is extremely slowly permeable below; stones and shallowness to bedrock may affect tiling; lack of outlets
Sprinkler irrigation	prolonged wetness
Road location	prolonged wetness; 50–100 cm to soft, easily split sandstone bedrock; may be stony

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	1.00–1.15	—	—	10–20	60–80	15–30	7–14	>20.0	0.10–0.15	4.0–5.0
40–75	1.45–1.75	GW–GM or SW–SM	A–1 or A–2	20–45	65–85	15–25	6–12	5.0–10.0	0.10–0.15	4.5–5.0
75+	soft, easily split, Pennsylvanian sandstone bedrock									

Fundy Association

Soil units: FU3, FU4, FU5 **Area:** 1943 ha

Description of soil

These are predominantly imperfectly drained, deep, yellowish brown, clayey-textured soils, moderate in natural fertility, which have formed in lacustrine deposit. The soil pH usually increases with depth from an acid surface to neutral at 150 cm deep. There is about 25–40 cm of relatively loose, permeable silt loam to silty clay loam surface soil over a dense compact extremely slowly permeable silty clay loam to silty clay subsoil. Except for occasional rounded soft sandstone gravel fragments (less than 1%), there are no coarse fragments. These soils occupy mid to lower slope positions either along tidal rivers with gently rolling slopes or on dried lake beds that tend to be almost level to undulating.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c,d	severe — shallowness to compact layer; extremely slowly permeable; seasonal wetness	4DW
		e	severe — shallowness to compact layer; extremely slowly permeable; seasonal wetness; slope	
Vegetable crops		all units	unsuitable — shallowness to compact layer; extremely slowly permeable subsoil; seasonal wetness	
Septic tanks		all units	severe — extremely slowly permeable; seasonal wetness	
Housing	with basement	all units	severe — seasonal wetness	
	without basement	a,b,c,d	moderate — seasonal wetness; potential frost and shrink-swell damage	
		e	moderate — seasonal wetness; potential frost and shrink-swell damage	
Sanitary landfill (area-type)		all units	moderate — seasonal wetness; subsoil texture (downgrade to severe if silty clay)	
Local roads and streets		a,b,c,d	moderate to severe — seasonal wetness; subgrade suitability; potential frost and shrink-swell damage	
		e	moderate to severe — seasonal wetness; subgrade suitability; potential frost and shrink-swell; slope	
Athletic fields		a,b	moderate — seasonal wetness; surface texture; potential frost action	
		c	moderate — seasonal wetness; surface texture; potential frost action; slope	
		d	severe — slope	
		e	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c	moderate — surface texture; seasonal wetness	
		d	moderate — seasonal wetness; surface texture; slope	
		e	severe — slope	
	picnic areas	a,b,c,d	moderate — seasonal wetness; surface texture	
		e	moderate — seasonal wetness; surface texture; slope	

Soil units: FU3, FU4, FU5

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe–moderate	Erosion hazards	a,b,c d e	slight to none moderate severe
Equipment limitations	all units	moderate (severe)	Windthrow hazards	all units	moderate
Species suitability	black spruce, balsam fir, white spruce*		Capability class	FU3, FU4 - 4^{w}_{bs} FU5 - 5^{w}_{bd}	

*Species of limited suitability.
Note: Parentheses indicate seasonal variation.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair	unsuitable	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	25–35 cm to an extremely slowly permeable subsoil; seasonal wetness; d-slopes and steeper may affect storage capacity
Pond embankment	subsoil has medium to low shear strength, medium compressibility, low compacted permeability, fair compaction characteristics, clayey material difficult to work
Drainage	seasonal wetness; 25–35 cm of permeable surface soil over an extremely slowly permeable subsoil
Sprinkler irrigation	seasonal wetness
Road location	seasonable wetness; potentially erodible; susceptible to shrink-swell and frost action ; clayey material difficult to work; cuts and fill necessary on d-slopes and steeper

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–30	1.00–1.30	—	—	<1%	10–40	40–70	15–30	>5.0	0.10–0.20	4.5–5.5
30+	1.70–1.90	CL–ML	A–4 (A–6)	<1%	3–10	40–60	35–50	<0.1	<0.10	5.5–7.0

Soil units: FU6, FU7 **Area: 17 566 ha**

Description of soil

These are predominantly poorly drained, deep, yellowish brown, clayey-textured soils, moderate in natural fertility, which have formed in lacustrine deposits. The soil pH usually increases with depth from an acid surface to neutral at 150 cm deep. There are about 25–35 cm of relatively loose, permeable silt loam to silty clay loam surface soil over a dense compact extremely slowly permeable silty clay loam to silty clay subsoil. With the possible exception of the occasional rounded soft sandstone gravel fragments (less than 1%), there are no coarse fragments. These soils occupy depressions and lower slope positions on undulating to almost level areas adjacent to tidal rivers or on dried lake beds

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	unsuitable — combined effect of prolonged wetness, shallowness to compact layer, extremely slow permeability	5WD
Vegetable crops		all units	unsuitable — combined effect of prolonged wetness, shallowness to compact layer, extremely slow permeability	
Septic tanks		all units	severe — prolonged wetness, extremely slowly permeable subsoil	
Housing	with basement	all units	severe — prolonged wetness, potential frost and shrink-swell damage	
	without basement	all units	severe — prolonged wetness, potential frost and shrink-swell damage	
Sanitary landfill (area type)		all units	moderate — prolonged wetness, subsoil texture (downgrade to severe if silty clay)	
Local roads and streets		all units	severe — prolonged wetness (subgrade suitability)	
Athletic fields		all units	severe — prolonged wetness	
Outdoor living	tent and trailer parks	all units	severe — prolonged wetness	
	picnic areas	all units	severe — prolonged wetness	

Soil units: FU6, FU7

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe	Erosion hazards	a,b,c d	slight to none moderate
Equipment limitations	all units	severe	Windthrow hazards	all units	severe–moderate
Species suitability	black spruce, balsam fir		Capability class	FU6 – 5W bs	FU7 – 6W bs

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair to poor	unsuitable	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	prolonged wetness; 25–35 cm to an extremely slowly permeable layer
Pond embankment	subsoil has medium to low shear strength, medium compressibility, low compacted permeability, fair compaction characteristics, clayey material difficult to work
Drainage	prolonged wetness; 25–35 cm of permeable material over extremely slowly permeable subsoil; outlets may be difficult to find
Sprinkler irrigation	prolonged wetness
Road location	prolonged wetness; potentially erodible; potential frost and shrink-swell damage; clayey material difficult to work

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–30	1.00–1.30	—	—	<1%	10–40	40–70	15–30	>5.0	0.10–0.20	4.5–5.5
30+	1.70–1.90	CL–CM	A–4 (A–6)	<1%	3–10	40–60	35–50	<0.1	<0.10	5.5–7.0

Soil units: FU8 **Area: 1198 ha**

Description of soil

These are predominantly very poorly drained, deep, yellowish brown clayey-textured soils, moderate in natural fertility, which have formed in lacustrine deposits. The soil pH usually increases with depth from an acid surface to neutral at 150 cm deep. There is about 25–30 cm of relatively loose, permeable silt loam to silty clay loam surface soil over a dense compact extremely slowly permeable silty clay loam to silty clay subsoil. Except for the occasional rounded soft sandstone gravel fragments (less than 1%), there are no coarse fragments. These soils occupy depressions associated with almost level landscapes of dried lake beds.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	unsuitable — permanently wet	7W
Vegetable crops		all units	unsuitable — permanently wet	
Septic tanks		all units	unsuitable — permanently wet	
Housing	with basement	all units	unsuitable — permanently wet	
	without basement	all units	unsuitable — permanently wet	
Sanitary landfill (area-type)		all units	severe — permanently wet	
Local roads and streets		all units	severe — permanently wet	
Athletic fields		all units	unsuitable — permanently wet	
Outdoor living	tent and trailer parks	all units	unsuitable — permanently wet	
	picnic areas	all units	unsuitable — permanently wet	

Soil unit: FU8

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe	Erosion hazards	all units	slight to none
Equipment limitations	all units	severe	Windthrow hazards	all units	severe
Species suitability	black spruce,* balsam fir*		Capability	6W bs	

*Species of limited suitability.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
poor	unsuitable	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	permanently wet; 25–35 cm of permeable soil over an extremely slowly permeable subsoil
Pond embankment	subsoil has medium to low shear strength, medium compressibility, low compacted permeability, fair compaction characteristics, clayey material difficult to work
Drainage	permanently wet; 25–35 cm of permeable surface soil over an extremely slowly permeable subsoil; outlets may be difficult to find
Sprinkler irrigation	permanently wet
Road location	permanently wet; potentially erodible; potential frost and shrink-swell damage; clayey material difficult to work

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–25	1.00–1.30	—	—	<1%	10–40	40–70	15–30	>5.0	0.10–0.20	4.5–5.5
25+	1.70–1.90	CL–ML	A–4 (A–6)	<1%	3–10	40–60	35–50	<0.1	<0.10	5.5–7.0

Gagetown Association

Soil units: G1, G2 **Area: 324 ha**

Description of soil

These are predominantly rapidly drained, deep, olive brown, acid, gravel soils, low in natural fertility, which have formed in loose glacial outwash deposits derived mainly from igneous and metamorphic rocks. The entire depth of the soil (greater than 100 cm) consists of a loose, rapidly permeable material, which grades from a gravelly loamy sand surface texture into a very gravelly sand subsoil. These soils usually have 40–80% gravel fragments of very hard, rounded, granites, schists, gneisses, slates, and volcanics. These soils usually occupy crest and upper slope positions in an undulating landscape or are associated with such distinctive landforms as kames and eskers. Typically they are found close to flowing water, but not necessarily, because some have been deposited by ancient rivers that have since ceased to exist.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c,d	severe — droughtiness;[1] fertility	4MF
		e	severe — droughtiness;[1] fertility; slope	
Vegetable crops		a,b,c	severe — droughtiness;[1] fertility; coarse fragments	
		d, part of e	severe — droughtiness;[1] fertility coarse fragments; slope	
Septic tanks		all units	unsuitable — permeability too rapid	
Housing	with basement	a,b,c,d	slight to none — few or no adverse conditions	
		e	moderate — slope	
	without basement	a,b,c,d	slight to none — few or no adverse conditions	
		e	moderate — slope	
Sanitary landfill (area-type)		all units	unsuitable — permeability too rapid	
Local roads and streets		a,b,c	slight to none — few or no adverse conditions	
		d,e	moderate — slope	
Athletic fields		a,b,c	severe — droughtiness;[1] possibly surface coarse fragments	
		d	severe — droughtiness;[1] slope; possibly surface coarse fragments	
		e	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c,d	severe — droughtiness[1]	
		e	severe — droughtiness;[1] slope	
	picnic areas	all units	severe — droughtiness[1]	

[1]Droughtiness may not be a severe problem where plowed layers have incorporated sufficient organic matter into the surface mineral soil to increase the water-holding capacity.

Soil units: G1, G2

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	a,b,c d,e	slight to none moderate	Erosion hazards	a,b,c,d,e	slight to none
Equipment limitations	a,b,c,d e	slight to none moderate	Windthrow hazards	all units	slight to none
Species suitability	jack pine, red pine, white pine*		Capability	$\frac{5^{M}_{F}}{jp}$	

*Species of limited suitability.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
poor	unsuitable to poor	good	good

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	very rapidly permeable subsoil; usually deep deposits; poor reservoir area
Pond embankment	gravel material; subsoil has high to medium shear strength; low compressibility; good compaction characteristics but high compacted permeability
Drainage	not needed
Sprinkler irrigation	very good infiltration rate but very low water-holding capacity; very rapidly permeable subsoil
Road location	easily worked; stable; cuts and fill necessary on d-slopes and steeper

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	1.20–1.40	—	—	15–35	75–95	5–15	2–10	>25.0	<0.10	4.0–5.0
40+	1.40–1.55	GP–SP	A–1	50–80	85–95	2–10	2–5	>25.0	<0.10	4.0–5.0

Soil units: G3, G4, G5 **Area: 648 ha**

Description of soil

These are predominantly imperfectly drained, deep, olive brown, acid, gravel soils, low in natural fertility, which have formed in loose glacial outwash deposits derived mainly from igneous and metamorphic rocks. The entire depth of the soil (greater than 100 cm) consists of a loose, rapidly permeable material that grades from a gravelly loamy sand surface texture into a very gravelly sand subsoil. These soils usually have 40–80% gravel fragments of very hard, rounded, granites, schists, gneisses, slates, and volcanics. These soils usually occupy lower slope positions in an undulating landscape or are associated with a fringe area around such distinctive landforms as kames and eskers. Typically they are found close to flowing water, but not necessarily, because some have been deposited by ancient rivers that have since ceased to exist.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c,d	severe — fertility; seasonal wetness; possibly draughty in midsummer	4FW
		e	severe — fertility; seasonal wetness; possibly draughty in midsummer	
Vegetable crops		a,b,c	severe — fertility; seasonal wetness; possibly draughty in midsummer	
		d, part of e	severe — fertility; seasonal wetness; possibly draughty in midsummer; slope	
Septic tanks		all units	unsuitable — permeability too rapid	
Housing	with basement	all units	severe — seasonal wetness	
	without basement	a,b,c,d	moderate — seasonal wetness	
		e	moderate — seasonal wetness; slope	
Sanitary landfill (area-type)		all units	unsuitable — permeability too rapid	
Local roads and streets		a,b,c	moderate — seasonal wetness	
		d,e	moderate — seasonal wetness; slope	
Athletic fields		a,b	moderate — seasonal wetness-draughtiness; surface texture	
		c	moderate — slope; seasonal wetness-draughtiness; surface texture	
		d	severe — slope	
		e	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c	moderate — seasonal wetness-droughtiness; surface texture	
		d	moderate — slope; seasonal wetness-draughtiness; surface texture	
		e	severe — slope	
	picnic areas	a,b,c,d	moderate — seasonal wetness-draughtiness; surface texture	
		e	moderate — slope; seasonal wetness-draughtiness; surface texture	

Soil units: G3, G4, G5

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	a,b,c d,e	slight to none moderate	Erosion hazards	all units	slight to none
Equipment limitations	a,b,c,d e	slight to none moderate	Windthrow hazards	all units	slight to none
Species suitability	jack pine, red pine, eastern white pine, black spruce, balsam fir		Capability class	G3, G4 – $\frac{4F}{jP}$	G5 – $\frac{5^{W}_{F}}{bs}$

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
poor	unsuitable to poor	good	fair

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	seasonal wetness; very rapidly permeable subsoil
Pond embankment	gravel material; subsoil has high to medium shear strength; low compressibility; good compaction characteristics, but high impacted permeability
Drainage	very rapidly permeable subsoil; seasonal wetness
Sprinkler irrigation	seasonal wetness, but soil tends to dry out in the summer and therefore irrigation should be beneficial; very good infiltration rate, but very low water-holding capacity
Road location	seasonal wetness; good stability

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	1.20–1.40	—	—	15–35	75–95	5–15	2–10	>25.0	<0.10	4.0–5.0
40+	1.40–1.55	GP–SP	A–1	50–80	85–95	2–10	2–5	>25.0	<0.10	4.0–5.0

Soil units: G6, G7 Area: 4 ha

Description of soil

These are predominantly very poorly drained, deep, olive brown, acid, gravel soils, low in natural fertility, which have formed in loose glacial outwash deposits derived mainly from igneous and metamorphic rocks. The entire depth of the soil (greater than 100 cm) consists of a loose, rapidly permeable material that grades from a gravelly loamy sand surface texture into a very gravelly sand subsoil. These soils usually have 40–80% gravel fragments of very hard, rounded, granites, schists, gneisses, slates, and volcanics. These soils usually occupy depressions in an undulating to level landscape and typically are found close to flowing water, but not necessarily, because some have been deposited by ancient rivers that have since ceased to exist.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	unsuitable — permanently wet	5W
Vegetable crops		all units	unsuitable — permanently wet	
Septic tanks		all units	unsuitable — permanently wet	
Housing	with basement	all units	unsuitable — permanently wet	
	without basement	all units	unsuitable — permanently wet	
Sanitary landfill (area-type)		all units	unsuitable — permeability is too rapid	
Local roads and streets		all units	severe — permanently wet	
Athletic fields		all units	unsuitable — permanently wet	
Outdoor living	tent and trailer parks	all units	unsuitable — permanently wet	
	picnic areas	all units	unsuitable — permanently wet	

Soil units: G6, G7

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	moderate	Erosion hazards	all	slight to none
Equipment limitations	all units	moderate	Windthrow hazards	all units	moderate
Species suitability	black spruce, balsam fir		Capability class	G6 - 5W bs	G7 - 6W bs

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
unsuitable	unsuitable	fair	fair

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	permanently wet; very rapidly permeable subsoil
Pond embankment	gravel material; subsoil has medium to low shear strength, low compressibility, good compaction characteristics but high compacted permeability
Drainage	permanently wet so drainage needed; very rapidly permeable subsoil but outlets may be difficult to find
Sprinkler irrigation	permanently wet; requires drainage first; very good infiltration rate but very low water-holding capacity
Road location	permanently wet

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–30	1.20–1.40	—	—	15–35	75–95	5–15	2–10	>25.0	<0.10	4.0–5.0
35+	1.40–1.55	GP–SP	A-1	50–80	85–95	2–10	2–5	>25.0	<0.10	4.0–5.0

Galloway Association

Soil units: GA1, GA2 **Area: 10 057 ha**

Description of soil

These are predominantly rapidly drained, moderately deep, olive brown, acid, sandy-textured soils, very low in natural fertility, which have formed in loose glacial marine deposits derived mainly from gray green sandstone, over a soft, easily split, Pennsylvanian sandstone bedrock. Total thickness of the soil over bedrock is 50–100 cm of a loose, rapidly permeable material that grades from a sandy loam to loamy sand surface texture into a sand (to loamy sand) subsoil. Although they are usually free of coarse fragments, some flat, platy sandstone fragments of bedrock may be observed near the bedrock contact. These soils usually occupy crests and upper slope positions in an undulating to nearly level landscape and are typically found near the coast.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c,d	severe — droughtiness;[1] depth to bedrock; fertility	4MR
		e	severe — droughtiness;[1] depth to bedrock; fertility; slope	
Vegetable crops		a,b,c	severe — droughtiness;[1] depth to bedrock; fertility	
		d, part of e	severe — droughtiness;[1] depth to bedrock; fertility; slope	
Septic tanks		all units	unsuitable — subsoil permeability	
Housing	with basement	a,b,c,d	moderate — depth to bedrock	
		e	moderate — depth to bedrock; slope (bedrock may be very easily split and have slight to no limitations)	
	without basement	a,b,c,d	slight to none — few or no adverse conditions	
		e	moderate — slope	
Sanitary landfill (area-type)		all units	unsuitable — subsoil permeability	
Local roads and streets		a,b,c	slight to none — few or no adverse conditions	
		d,e	moderate — slope	
Athletic fields		a,b,c	severe — droughtiness[1]	
		d	severe — droughtiness;[1] slope	
		e	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c,d	severe — droughtiness[1]	
		e	severe — droughtiness;[1] slope	
	picnic areas	all units	severe — droughtiness[1]	

Note: These soils are moderately deep phases (50–100 cm to bedrock) of the rapidly drained member of the Richibucto association.

[1]Droughtiness may not be a severe problem when plowed layers have incorporated sufficient organic matter into the surface mineral soil to increase water-holding capacity.

Soil units: GA1, GA2

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	a,b,c d,e	slight to none moderate	Erosion hazards	a,b,c,d e	slight to none moderate
Equipment limitations	a,b,c,d e	slight to none moderate	Windthrow hazards	all units	slight to none
Species suitability	jack pine, red pine, eastern white pine*		Capability class	5^{M}_{P} jp	

*Species of limited suitability.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
poor (fair if sandy loam)	fair	unsuitable	good

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	50–100 cm of rapidly permeable material over bedrock that is readily permeable in the top metre, but extremely slowly permeable below
Pond embankment	sandy material; limited quantity of subsoil; subsoil has medium shear strength, low compressibility, high compacted permeability, good compaction characteristics
Drainage	not needed
Sprinkler irrigation	very good infiltration rate, but very low water-holding capacity; 50–100 cm of rapidly permeable material over bedrock that is readily permeable in the top metre
Road location	50–100 cm to bedrock; easily worked; cuts and fill necessary on d-slopes and steeper

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	1.20–1.40	—	—	<2%	75–95	5–15	2–10	>25.0	0.08–0.12	4.0–5.0
40–75	1.40–1.55	SP	A-3	<2%	85–97	2–10	2–5	>25.0	<0.10	4.0–5.0
75+	soft, easily split, Pennsylvanian sandstone bedrock									

Soil units: GA3, GA4, GA5 **Area: 11 798 ha**

Description of soil

These are predominantly imperfectly drained, moderately deep, olive brown, acid, sandy-textured soils, very low in natural fertility, which have formed in loose glacial marine deposits derived mainly from gray green sandstone, over a soft, easily split, Pennsylvanian sandstone bedrock. Total thickness of the soil over bedrock is 50–100 cm of a loose, rapidly permeable material that grades from a sandy loam to loamy sand surface texture into a sand (to loamy sand) subsoil. Although they are usually free of coarse fragments, some flat, platy sandstone fragments of the bedrock may be observed near the bedrock contact. These soils usually occupy areas on the edges of depressions and lower slope positions in an undulating to almost level landscape and are typically found near the coast.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c,d	severe — fertility; depth to bedrock; seasonal wetness; possibly droughty in summer	4RW
		e	severe — fertility; depth to bedrock; seasonal wetness; slope; possibly droughty in summer	
Vegetable crops		a,b,c	severe — fertility; depth to bedrock; seasonal wetness; possibly droughty in summer	
		d, part of e	severe — fertility; depth to bedrock; seasonal wetness; slope; possibly droughty in summer	
Septic tanks		all units	unsuitable — subsoil permeability	
Housing	with basement	all units	severe — seasonal wetness	
	without basement	a,b,c,d	moderate — seasonal wetness	
		e	moderate — seasonal wetness; slope	
Sanitary landfill (area-type)		all units	unsuitable — subsoil permeability	
Local roads and streets		a,b,c	moderate — seasonal wetness	
		d,e	moderate — seasonal wetness; slope	
Athletic fields		a,b	moderate — seasonal wetness-droughtiness; depth to bedrock	
		c	moderate — seasonal wetness-droughtiness; depth to bedrock; slope	
		d	severe — slope	
		e	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c	moderate — seasonal wetness-droughtiness; surface texture if loamy sand	
		d	moderate — seasonal wetness-droughtiness; slope; surface texture if loamy sand	
		e	severe — slope	
	picnic areas	a,b,c,d	moderate — seasonal wetness-droughtiness; surface texture if loamy sand	
		e	moderate — seasonal wetness-droughtiness; slope; surface texture if loamy sand	

Note: These soils are moderately deep phases (50–100 cm to bedrock) of the imperfectly drained member of the Richibucto association.

Soil units: GA3, GA4, GA5

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	moderate	Erosion hazards	a,b,c,d	slight to none moderate
Equipment limitations	a,b,c,d e	slight to none moderate	Windthrow hazards	all units	slight to none
Species suitability	jack pine, red pine, eastern white pine		Capability class	GA3, GA4 – 4F jp	GA5 – 5^{1}_{w} bs

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
poor (fair if sandy loam)	fair	unsuitable	fair

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	50–100 cm of rapidly permeable material over bedrock that is readily permeable in the top metre, but is extremely slowly permeable below
Pond embankment	sandy material; limited amount of subsoil; subsoil has medium shear strength, low compressibility, high compacted permeability, good compaction characteristics
Drainage	seasonal wetness; rapidly permeable subsoil; 50–100 cm to bedrock; bedrock may affect tile laying
Sprinkler irrigation	seasonal wetness, but soil tends to dry out during summer and so irrigation may be beneficial; very good infiltration rate but very low water-holding capacity
Road location	seasonal wetness; 50–100 cm to bedrock

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	1.20–1.40	—	—	<2	75–95	5–15	2–10	>25.0	0.08–0.12	4.0–5.0
40–75	1.40–1.55	SP	A–3	<2	85–95	2–10	2–5	>25.0	<0.10	4.0–5.0
75+	soft easily split Pennsylvanian sandstone bedrock									

Soil units: GA6, GA7 **Area: 9330 ha**

Description of soil

These are predominantly poorly drained, moderately deep, olive brown, acid, sandy-textured soils, very low in natural fertility, which have formed in loose glacial marine deposits derived mainly from gray green sandstone, over a soft, easily split, Pennsylvanian sandstone bedrock. Total thickness of the soil over bedrock is 50–100 cm of a loose, rapidly permeable material that grades from a sandy loam to loamy sand surface texture into a sand (to loamy sand) subsoil. Although they are usually free of coarse fragments, some flat, platy sandstone fragments may be observed near the bedrock contact; these are pieces of the bedrock. These soils usually occupy depressions and lower slope positions in an almost level to slightly undulating landscape and typically are found near the coast.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	severe — excessive wetness; fertility	5WF
Vegetable crops		all units	unsuitable — excessive wetness; fertility	
Septic tanks		all units	unsuitable — subsoil permeability	
Housing	with basement	all units	severe (GA6) or unsuitable (GA7) — prolonged wetness	
	without basement	all units	severe — prolonged wetness	
Sanitary landfill (area-type)		all units	unsuitable — prolonged wetness (true groundwater table); subsoil permeability	
Local roads and streets		all units	severe — prolonged wetness	
Athletic fields		a,b,c d	severe — prolonged wetness severe — prolonged wetness; slope	
Outdoor living	tent and trailer parks	all units	severe — prolonged wetness	
	picnic areas	all units	severe — prolonged wetness	

Note: These soils are moderately deep phases (50–100 cm to bedrock) of the poorly drained member of the Richibucto association.

Soil units: GA6, GA7

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe	Erosion hazards	all units	slight to none
Equipment limitations	all units	moderate	Windthrow hazards	all units	moderate
Species suitability	black spruce, balsam fir		Capability class	6W bs	

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
poor (fair if sandy loam)	poor	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	prolonged wetness; 50–100 cm of rapidly permeable material over bedrock that is readily permeable in the top metre, but extremely slowly permeable below
Pond embankment	sandy material; limited quantity of subsoil; subsoil has medium shear strength, low compressibility, high compacted permeability, good compaction characteristics
Drainage	prolonged wetness; rapidly permeable subsoil; 50–100 cm to bedrock; bedrock may hinder tiling; outlets may be difficult to find
Sprinkler irrigation	prolonged wetness; must be drained first; very good infiltration rate but very low water-holding capacity
Road location	prolonged wetness; 50–100 cm to bedrock

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–35	1.20–1.40	—	—	<2	75–95	5–15	2–10	>25.0	0.08–0.12	4.0–5.0
35–75	1.40–1.55	SP	A-3	<2	85–97	2–10	2–5	>25.0	<0.10	4.0–5.0

75+ soft, easily split, Pennsylvanian sandstone bedrock

Guimond River Association

Soil units: GR1, GR2 **Area: 2560 ha**

Description of soil

These are predominantly rapidly drained, deep, olive brown, acid, gravel soils, very low in natural fertility, which have formed in loose glacial outwash deposits derived mainly from gray green sandstone. The entire depth of the soil (greater than 100 cm) consists of a loose, rapidly permeable material that grades from a loamy sand to gravelly loamy sand surface texture into a very gravelly sand subsoil. These soils usually have 40–80% gravel fragments of rounded soft sandstone. The soils usually occupy crest and upper slope positions in an undulating landscape or are associated with such distinctive landforms as kames and eskers. Typically they are found close to flowing water, but not necessarily, because some have been deposited by ancient rivers that have since dried up.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c,d	severe — droughtiness;[1] fertility	4MF
		e	severe — droughtiness;[1] fertility; slope	4MT
Vegetable crops		a,b,c	severe — droughtiness;[1] fertility	
		d, part of e	severe — droughtiness;[1] fertility; slope	
Septic tanks		all units	unsuitable — permeability too rapid	
Housing	with basement	a,b,c,d	slight to none — few or no adverse conditions	
		e	moderate — slope	
	without basement	a,b,c,d	slight to none — few or no adverse conditions	
		e	moderate — slope	
Sanitary landfill (area-type)		all units	unsuitable — permeability too rapid	
Local roads and streets		a,b,c	slight to none — few or no adverse conditions	
		d,e	moderate — slope	
Athletic fields		a,b,c	severe — droughtiness[1]	
		d	severe — droughtiness;[1] slope	
		e	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c,d	severe — droughtiness[1]	
		e	severe — droughtiness;[1] slope	
	picnic areas	all units	severe — droughtiness[1]	

[1]Droughtiness may not be a severe problem where the plowed layer has incorporated sufficient organic matter into the surface mineral soil to increase water-holding capacity.

Soil units: GR1, GR2

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	a,b,c d,e	slight to none moderate	Erosion hazards	a,b,c,d,e	slight to none
Equipment limitations	a,b,c,d e	slight to none moderate	Windthrow hazards	all units	slight to none
Species suitability	jack pine, red pine, eastern white pine*		Capability class	$\frac{5^M_F}{jp}$	

*Species of limited suitability.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
poor	unsuitable to poor	fair	good

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	very rapid permeability; usually deep deposits; poor reservoir area
Pond embankment	gravel material; subsoil has medium shear strength; low compressibility; good compaction characteristics but high compacted permeability
Drainage	not needed
Sprinkler irrigation	very good infiltration rate but very low water-holding capacity; very rapidly permeable subsoil
Road location	easily worked; stable; cuts and fill necessary on d-slopes and steeper

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	1.20–1.40	—	—	10–30	75–95	5–15	2–10	>25.0	<0.10	4.0–5.0
40+	1.40–1.55	SP–SM	A–1	50–80	85–95	2–10	2–5	>25.0	<0.00	4.0–5.0

Soil units: GR3, GR4, GR5 Area: 1252 ha

Description of soil

These are predominantly imperfectly drained, deep, olive brown, acid, gravel soils, very low in natural fertility, which have formed in loose glacial outwash deposits derived mainly from gray green sandstone. The entire depth of the soil (greater than 100 cm) consists of a loose, rapidly permeable material that grades from a loamy sand to gravelly loamy sand surface texture into a very gravelly sand subsoil. These soils usually have 40–80% gravel fragments of rounded soft sandstone. The soils usually occupy lower slope positions in an undulating landscape or are associated with a fringe area around such distinctive landforms as kames and eskers. Typically they are found close to flowing water, but not necessarily, because some have been deposited by ancient rivers that have since ceased to exist.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c,d	severe — fertility; seasonal wetness; possibly draughty in midsummer	4FW
		e	severe — fertility; seasonal wetness; slope; possibly draughty in midsummer	4WT
Vegetable crops		a,b,c	severe — fertility; seasonal wetness; possibly draughty in midsummer	
		d, and part of e	severe — fertility; seasonal wetness; possibly draughty in midsummer; slope	
Septic tanks		all units	unsuitable — permeability too rapid	
Housing	with basement	all units	severe — seasonal wetness	
	without basement	a,b,c,d	moderate — seasonal wetness	
		e	moderate — seasonal wetness; slope	
Sanitary landfill (area-type)		all units	unsuitable — permeability too rapid	
Local roads and streets		a,b,c	moderate — seasonal wetness	
		d,e	moderate — seasonal wetness; slope	
Athletic fields		a,b	moderate — seasonal wetness-draughtiness; surface texture	
		c	moderate — slope; seasonal wetness-draughtiness; surface texture	
		d	severe — slope	
		e	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c	moderate — seasonal wetness-draughtiness; surface texture	
		d	moderate — slope; seasonal wetness-draughtiness; surface texture	
		e	severe — slope	
	picnic areas	a,b,c,d	moderate — seasonal wetness-draughtiness; surface texture	
		e	moderate — slope; seasonal wetness-draughtiness; surface texture	

Soil units: GR3, GR4, GR5

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	a,b,c d,e	slight to none moderate	Erosion hazards	all units	slight to none
Equipment limitations	a,b,c,d e	slight to none moderate	Windthrow hazards	all units	slight to none
Species suitability	jack pine, red pine, white pine, black spruce, balsam fir		Capability class	GR3, GR4 – $\frac{4F}{jp}$	GR5 – $\frac{5t_w}{bs}$

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
poor	unsuitable to poor	fair	fair

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	very rapidly permeable subsoil; seasonably wet
Pond embankment	gravel material; subsoil has medium shear strength, low compressibility good compaction characteristics but high compacted permeability
Drainage	very rapidly permeable subsoil; seasonal wetness
Sprinkler irrigation	seasonal wetness but soil tends to dry out during the summer and so irrigation should be beneficial; very good infiltration rate but very low water-holding capacity
Road location	seasonal wetness; good stability

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	1.20–1.40	—	—	10–30	75–95	5–15	2–10	>25.0	<0.10	4.0–5.0
40+	1.40–1.55	SP–SM	A–1	50–80	85–95	2–10	2–5	>25.0	<0.10	4.0–5.0

Soil units: GR6, GR7 Area: 201 ha

Description of soil

These are predominantly very poorly drained, deep, olive brown, acid, gravel soils, very low in natural fertility, which have formed in loose glacial outwash deposits derived mainly from gray green sandstone. The entire depth of the soil (greater than 100 cm) consists of a loose, rapidly permeable material that grades from a loamy sand to gravelly loamy sand surface texture into a very gravelly sand subsoil. These soils usually have 40–80% gravel fragments of rounded soft sandstone. They usually occupy depressions in an undulating to level landscape and typically are found close to flowing water, but not necessarily, because some have been deposited by ancient rivers that have since ceased to exist.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	unsuitable — permanently wet	5W
Vegetable crops		all units	unsuitable — permanently wet	
Septic tanks		all units	unsuitable — permanently wet; permeability too rapid	
Housing	with basement	all units	unsuitable — permanently wet	
	without basement	all units	unsuitable — permanently wet	
Sanitary landfill (area-type)		all units	unsuitable — permeability too rapid	
Local roads and streets		all units	severe — permanently wet	
Athletic fields		all units	unsuitable — permanently wet	
Outdoor living	tent and trailer parks	all units	unsuitable — permanently wet	
	picnic areas	all units	unsuitable — permanently wet	

Soil units: GR6, GR7

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	moderate	Erosion hazards	all units	slight to none
Equipment limitations	all units	moderate	Windthrow hazards	all units	moderate
Species suitability	black spruce, balsam fir		Capability class	GR6 – $5W_{bs}$	GR7 – $6W_{bs}$

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
unsuitable	unsuitable	poor	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	permanently wet; very rapidly permeable subsoil
Pond embankment	gravel material; subsoil has medium shear strength, low compressibility good compaction characteristics but high compacted permeability
Drainage	permanently wet so drainage needed; very rapidly permeable subsoil but outlets may be difficult to find
Sprinkler irrigation	permanently wet; requires drainage first; very good infiltration rate but very low water-holding capacity
Road location	permanently wet

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–30	1.20–1.40	—	—	10–30	75–95	5–15	2–10	>25.0	<0.10	4.0–5.0
30+	1.40–1.55	SP–SM	A–1	50–80	85–95	2–10	2–5	>25.0	<0.10	4.0–5.0

Harcourt Association

Soil unit: HT2 **Area: 10 931 ha**

Description of soil

These are predominantly moderately well drained, deep, acid, fine-textured soils, low in natural fertility, which have formed in a thin surficial mantle of yellowish brown, relatively loose till dominated by gray green sandstone over a reddish brown, compact till derived mainly from a combination of red shale and gray green sandstone. Frequently the boundary between the two materials is marked by an accumulation of stones forming a "stoneline." The relatively loose surface material is usually 30–45 cm thick, has a sandy loam to loam texture, is permeable, and contains about 5–15% coarse fragments of soft sandstone, whereas the dense compact subsoil has a loam to clay loam or sandy clay loam texture, is extremely slowly permeable, and contains about 10–25% coarse fragments of soft sandstone. These soils usually occupy crests or upper slope positions in an undulating landscape.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	severe — depth to compact layer (shallowness of rooting zone); extremely slow permeability	4D
Vegetable crops		all units	severe — depth to compact layer (shallowness of rooting zone); extremely slow permeability; slope (if d-slope)	
Septic tanks		all units	severe — extremely slow permeability	
Housing	with basement	all units	moderate — seasonal wetness; potential frost damage	
	without basement	all units	moderate — potential frost damage	
Sanitary landfill (area-type)		all units	moderate — seasonal wetness; subsoil texture (if clay loam)	
Local roads and streets		a,b,c	moderate — seasonal wetness; subgrade suitability, potential frost damage	
		d	moderate — seasonal wetness; slope; subgrade suitability; potential frost damage	
Athletic fields		a,b	moderate — potential frost damage (surface coarse fragments)	
		c	moderate — slope; potential frost damage (surface coarse fragments)	
		d	severe — slope	
Outdoor living	tent and trailer parks	a,b,c	slight to none— few or no adverse conditions	
		d	moderate — slope	
	picnic areas	all units	slight to none — few or no adverse conditions	

Soil unit: HT2

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	a,b,c d,e f	slight to none (moderate) moderate severe	Erosion hazards	a,b,c d,e f	slight to none moderate severe
Equipment limitations	a,b,c,d e,f	slight to none moderate	Windthrow hazards	all units	moderate
Species suitability	black spruce, balsam fir, white spruce, sugar maple, birch (white and yellow), beech		Capability class	4^{P}_{F} bs	

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair (if not stoney phase)	unsuitable	unsuitable	fair (subsoil)

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	30–45 cm to extremely slowly permeable subsoil; d-slope may affect storage capacity
Pond embankment	subsoil has medium to low shear strength, low to medium compressibility, low compacted permeability, fair to good compaction characteristics, 10–25% coarse fragments (soft sandstone)
Drainage	usually not needed, but may speed up drying out in the spring; 30–45 cm to extremely permeable subsoil
Sprinkler irrigation	good available water-holding capacity; good infiltration rate; 30–45 cm of permeable surface soil over extremely slowly permeable subsoil
Road location	subsoil is potentially erodible; potential frost damage; cuts and fill necessary on d-slopes

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	0.90–1.20	—	—	5–15	45–65	25–35	15–25	>5.0	0.20–0.25	4.0–5.0
40+	1.80–2.00	SM–SC	A–4	10–25	40–50	25–35	25–35	<0.1	<0.10	4.0–5.0

Soil units: HT3, HT4, HT5 **Area: 27 544 ha**

Description of soil

These are predominantly imperfectly drained, deep, acid, fine-textured soils, low in natural fertility, which have formed in a thin surficial mantle of yellowish brown, relatively loose till dominated by gray green sandstone over a reddish brown, compact till derived mainly from a combination of red shale and gray green sandstone. Frequently the boundary between the two materials is marked by an accumulation of stones forming a "stoneline." The relatively loose surface material is usually 30–45 cm thick, has a sandy loam to loam texture, is permeable, and contains about 5–15% coarse fragments of soft sandstone, whereas the dense compact subsoil has a loam to clay loam or sandy clay loam texture, is extremely slowly permeable, and contains about 10–25% coarse fragments of soft sandstone. These soils usually occupy areas on the edges of depressions and middle to lower slope positions in an undulating to almost level landscape.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	severe — depth to compact layer (shallowness of rooting zone); extremely slow permeability; seasonal wetness	4DW
Vegetable crops		all units	severe — depth to compact layer (shallowness of rooting zone); extremely slow permeability; slope (if d-slope); seasonal wetness	
Septic tanks		all units	severe — subsoil permeability; seasonal wetness	
Housing	with basement	all units	severe — seasonal wetness	
	without basement	all units	moderate — seasonal wetness; potential frost damage	
Sanitary landfill (area-type)		all units	moderate – seasonal wetness; subsoil texture (if clay loam)	
Local roads and streets		a,b,c	moderate — seasonal wetness; subgrade suitability; potential frost damage	
		d	moderate — seasonal wetness; slope; subgrade suitability; potential frost damage	
Athletic fields		a,b	moderate — seasonal wetness; potential frost damage (surface coarse fragments)	
		c	moderate — seasonal wetness; slope; potential frost damage (surface coarse fragments)	
		d	severe — slope	
Outdoor living	tent and trailer parks	a,b,c	moderate — seasonal wetness	
		d	moderate — seasonal wetness; slope	
	picnic areas	all units	moderate — seasonal wetness	

Soil units: HT3, HT4, HT5

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	moderate	Erosion hazards	a,b,c d,e	slight to none moderate
Equipment limitations	all units	moderate	Windthrow hazards	all units	moderate
Species suitability	black spruce, balsam fir, yellow birch, white spruce*		Capability class	HT3, HT4 – $\frac{4^{D}_{W}}{bs}$	HT5 – $\frac{5^{W}_{D}}{bs}$

*Species of limited suitability.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair (if not stony phase)	unsuitable	unsuitable	fair (subsoil)

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	30–45 cm to extremely slowly permeable subsoil; seasonal wetness; d-slopes may affect storage capacity
Pond embankment	subsoil has medium to low shear strength, low to medium compressibility, low compacted permeability, fair to good compaction characteristics, 10–25% coarse fragments (soft sandstone)
Drainage	seasonal wetness; 30–45 cm of permeable surface soil over extremely slowly permeable subsoil; tile laying may be affected by stoniness
Sprinkler irrigation	seasonal wetness; 30–45 cm to extremely slowly permeable subsoil
Road location	seasonal wetness; potentially erodible subsoil; cuts and fill may be necessary on d-slopes; potential moderate frost damage

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	0.90–1.20	—	—	5–15	45–65	25–35	15–25	>5.0	0.20–0.25	4.0–5.0
40+	1.80–2.00	SM-SC	A-4	10–25	40–50	25–35	25–35	<0.1	<0.10	4.0–5.0

Soil units: HT6, HT7 **Area: 26 146 ha**

Description of soil

These are predominantly poorly drained, deep, acid, fine-textured soils, low in natural fertility, which have formed in a thin surficial mantle of yellowish brown, relatively loose till dominated by gray green sandstone over a reddish brown, compact till derived mainly from a combination of red shale and gray green sandstone. Frequently the boundary between the two materials is marked by an accumulation of stones forming a "stoneline." The relatively loose surface material is usually 30–40 cm thick, has a sandy loam to loam texture, is permeable, and contains about 5–15% coarse fragments of soft sandstone, whereas the dense, compact subsoil has a loam to clay loam or sandy clay loam texture, is extremely slowly permeable, and contains about 10–25% coarse fragments of soft sandstone. These soils usually occupy depressions and lower slope positions in an undulating to almost level landscape.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	unsuitable — combined effect of shallowness to compact layer, extremely slow subsoil permeability, and excessive wetness	5WD
Vegetable crops		all units	unsuitable — combined effect of shallowness to a compact layer, excessive wetness	
Septic tanks		all units	severe — prolonged wetness; extremely slow permeability	
Housing	with basement	all units	severe — prolonged wetness; potential frost damage	
	without basement	all units	severe — prolonged wetness; potential frost damage	
Sanitary landfill (area-type)		all units	moderate — prolonged wetness; subsoil texture	
Local roads and streets		all units	severe — prolonged wetness; potential frost damage	
Athletic fields		all units	severe — prolonged wetness; potential frost damage	
Outdoor living	tent and trailer parks	all units	severe — prolonged wetness	
	picnic areas	all units	severe — prolonged wetness	

Soil units: HT6, HT7

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe	Erosion hazards	all units	slight to none
Equipment limitations	all units	moderate-severe	Windthrow hazards	all units	moderate-severe
Species suitability	black spruce, balsam fir		Capability class	HT6 - $\frac{D^{W}}{bs}$	HT7 - $\frac{6W}{bs}$

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair	unsuitable	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	30–40 cm to extremely slowly permeable subsoil; prolonged wetness
Pond embankment	subsoil has medium to low shear strength, low to medium compressibility, low compacted permeability, fair to good compaction characteristics, 10–25% coarse fragments (soft sandstone)
Drainage	prolonged wetness; 30–40 cm to extremely slowly permeable subsoil; tile laying may be affected by stoniness; outlets may be difficult to find
Sprinkler irrigation	prolonged wetness
Road location	prolonged wetness; potentially erodible subsoil; potential severe frost damage

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–35	0.90–1.20	—	—	5–15	45–65	25–35	15–25	>5.0	0.20–0.25	4.0–5.0
35+	1.80–2.00	SM–SC	A–4	10–25	40–50	25–35	25–35	<0.1	<0.10	4.0–5.0

Soil unit: HT8 **Area: 195 ha**

Description of soil

These are predominantly very poorly drained, deep, acid, fine-textured soils, low in natural fertility, which have formed in a thin surficial mantle of yellowish brown, relatively loose till dominated by gray green sandstone over a reddish brown, compact till derived mainly from a combination of red shale and gray green sandstone. Frequently, the boundary between the two materials is marked by an accumulation of stones forming a "stoneline." The relatively loose surface material is usually 30–40 cm thick, has a sandy loam to loam texture, is permeable, and contains about 5–15% coarse fragments of soft sandstone, whereas the dense, compact subsoil has a loam to clay loam or sandy clay loam texture, is extremely slowly permeable, and contains about 10–25% coarse fragments of soft sandstone. These soils usually occupy depressions and lower slope positions in a slightly undulating to almost level landscape.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	unsuitable — permanently wet	7W
Vegetable crops		all units	unsuitable — permanently wet	
Septic tanks		all units	unsuitable — permanently wet	
Housing	with basement	all units	unsuitable — permanently wet	
	without basement	all units	unsuitable — permanently wet	
Sanitary landfill (area-type)		all units	severe — prolonged wetness	
Local roads and streets		all units	severe — prolonged wetness; potential frost damage	
Athletic fields		all units	unsuitable — permanently wet	
Outdoor living	tent and trailer parks	all units	unsuitable — permanently wet	
	picnic areas	all units	unsuitable — permanently wet	

Soil unit: HT8

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe	Erosion hazards	all units	slight to none
Equipment limitations	all units	severe	Windthrow hazards	all units	severe
Species suitability	black spruce,* balsam fir*		Capability class	6W bs	

*Species of limited suitability.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
poor	unsuitable	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	30–40 cm to extremely slowly permeable subsoil; permanently wet
Pond embankment	subsoil has medium to low shear strength, low to medium compressibility, low compacted permeability, fair to good compaction characteristics, 10–25% coarse fragments (soft sandstone)
Drainage	permanently wet; 30–40 cm to extremely slowly permeable subsoil; tile laying may be affected by stoniness; outlets may be difficult to find
Sprinkler irrigation	permanently wet
Road location	permanently wet; potentially erodible subsoil; potential severe frost damage

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–35	0.90–1.20	—	—	5–15	45–65	25–35	15–25	>5.0	0.20–0.25	4.0–5.0
35+	1.80–2.00	SM–SC	A–4	10–25	40–50	25–35	25–35	<0.1	<0.10	4.0–5.0

Interval Association

Soil unit: IN2 **Area: 26 ha**

Description of soil

These are predominantly moderately well drained, deep, yellowish to grayish brown, acid, medium-textured soils, high in natural fertility, which have formed in alluvial deposits. The entire depth of the soil is relatively loose, permeable, stratified silt loam (the subsoil may be slightly firm). No coarse fragments are present. These soils occupy level to almost level stream terraces and floodplains.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c	slight to none — few or no adverse conditions except for some flooding	21
Vegetable crops		a,b c	slight to none — few or no adverse conditions except for some flooding moderate — slope	
Septic tanks		all units	unsuitable — frequent flooding	
Housing	with basement	all units	unsuitable — subject to flooding	
	without basement	all units	unsuitable — subject to flooding	
Sanitary landfill (area-type)		all units	unsuitable — subject to flooding	
Local roads and streets		all units	severe — subject to flooding and frost damage; subgrade suitability	
Athletic fields		all units	severe — susceptibility to frost damage	
Outdoor living	tent and trailer parks	all units	moderate — subject to flooding	
	picnic areas	all units	moderate — subject to flooding	

Soil unit: IN2

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe	Erosion hazards	a,b,c	slight to none
Equipment limitations	all units	slight to none	Windthrow hazards	all units	slight to none
Species suitability	white spruce, black spruce, balsam fir, sugar maple, white and yellow birch, beech		Capability class	$\frac{3^F}{bs}$	

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
good	unsuitable	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	permeable subsoil
Pond embankment	subsoil has medium to low shear strength, medium compressibility, medium compacted permeability; fair to poor compaction characteristics
Drainage	permeable subsoil; moderately well drained; drainage not needed
Sprinkler irrigation	good infiltration rate and water-holding capacity
Road location	flood hazard; potentially erodible; susceptible to frost damage

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–30	1.00–1.30	—	—	0%	25–45	40–60	10–20	>10.0	>0.20	5.0–6.0
30+	1.30–1.55	ML	A–4	0%	25–45	40–60	10–20	>5.0	>0.20	5.0–6.0

Soil units: IN3, IN4, IN5 **Area: 118 ha**

Description of soil

These are predominantly imperfectly drained, deep, yellowish to grayish brown, acid, medium-textured soils, high in natural fertility which have formed in alluvial deposits. The entire depth of the soil is relatively loose, permeable, stratified silt loam (the subsoil may be slightly firm). No coarse fragments are present. These soils occupy level to almost level stream terraces and floodplains.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	moderate — seasonal wetness	3WI
Vegetable crops		a,b c	moderate — seasonal wetness moderate — seasonal wetness; slope	
Septic tanks		all units	unsuitable — subject to flooding	
Housing	with basement	all units	unsuitable — subject to flooding	
	without basement	all units	unsuitable — subject to flooding	
Sanitary landfill (area-type)		all units	unsuitable — subject to flooding	
Local roads and streets		all units	severe — subject to flooding and frost damage; subgrade suitability	
Athletic fields		all units	severe — susceptibility to frost damage	
Outdoor living	tent and trailer parks	all units	moderate — seasonal wetness; subject to flooding	
	picnic areas	all units	moderate — seasonal wetness; subject to flooding	

Soil units: IN3, IN4, IN5

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe	Erosion hazards	all units	slight to none
Equipment limitations	all units	moderate	Windthrow hazards	all units	slight to none
Species suitability	white spruce,* black spruce, balsam fir, yellow birch, white birch*		Capability class	$\frac{3^F}{bs}$	

*Species of limited suitability.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
good	unsuitable	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	permeable subsoil; seasonal wetness
Pond embankment	subsoil has medium to low shear strength, medium compressibility, medium compacted permeability, fair to poor compaction characteristics
Drainage	seasonal wetness; permeable subsoil; floods
Sprinkler irrigation	seasonal wetness; needs drainage first; good water-holding capacity; good infiltration rate
Road location	seasonal wetness; flood hazard; potentially erodible subsoil; susceptible to frost damage

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–30	1.00–1.30	—	—	0%	25–45	40–60	10–20	>10.0	>0.20	5.0–6.0
30+	1.30–1.55	ML	A–4	0%	25–45	40–60	10–20	>5.0	>0.20	5.0–6.0

Soil units: IN6, IN7 **Area: 1486 ha**

Description of soil

These are predominantly poorly drained, deep, yellowish to grayish brown, acid, medium-textured soils, high in natural fertility, which have formed in alluvial deposits. The entire depth of the soil is relatively loose, permeable, stratified silt loam (the subsoil may be slightly firm). No coarse fragments are present. These soils occupy low-drying areas in level to almost level stream terraces and floodplains.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	severe — prolonged wetness	4WI
Vegetable crops		all units	severe to unsuitable — prolonged wetness combined with flooding problems	
Septic tanks		all units	unsuitable — subject to flooding	
Housing	with basement	all units	unsuitable — subject to flooding	
	without basement	all units	unsuitable — subject to flooding	
Sanitary landfill (area-type)		all units	unsuitable — subject to flooding	
Local roads and streets		all units	unsuitable — subject to frequent flooding	
Athletic fields		all units	severe — subject to frequent flooding; susceptibility to frost damage	
Outdoor living	tent and trailer parks	all units	severe — subject to frequent flooding	
	picnic areas	all units	severe — subject to frequent flooding	

Soil units: IN6, IN7

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe	Erosion hazards	all units	slight to none
Equipment limitations	all units	severe	Windthrow hazards	all units	moderate
Species suitability	black spruce, balsam fir		Capability class	5^{w}_{bs}	

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair	unsuitable	unsuitable	poor to unsuitable

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	permeable subsoil; prolonged wetness
Pond embankment	subsoil has medium to low shear strength, medium compressibility, medium compact permeability, fair to poor compaction characteristics
Drainage	prolonged wetness; permeable subsoil; frequent flooding
Sprinkler irrigation	prolonged wetness; needs drainage first
Road location	prolonged wetness; potentially erodible; frequent flooding; susceptible to frost damage

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–30	1.00–1.30	—	—	0%	25–45	40–60	10–20	>10.0	>0.20	5.0–6.0
30+	1.30–1.55	ML	A–4	0%	25–45	40–60	10–20	>5.0	>0.20	5.0–6.0

Soil unit: IN8 **Area: 288 ha**

Description of soil

These are predominantly very poorly drained, deep, yellowish to grayish brown, acid, medium-textured soils, high in natural fertility, which have formed in alluvial deposits. The entire depth of the soil is a relatively loose, permeable, stratified silt loam (the subsoil may be slightly firm). No coarse fragments are present. These soils occupy depressions in level to almost level stream terraces and floodplains.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	unsuitable — permanently wet	7W
Vegetable crops		all units	unsuitable — permanently wet	
Septic tanks		all units	unsuitable — permanently wet; subject to flooding	
Housing	with basement	all units	unsuitable — permanently wet; subject to flooding	
	without basement	all units	unsuitable — permanently wet; subject to flooding	
Sanitary landfill (area-type)		all units	unsuitable — permanently wet; subject to flooding	
Local roads and streets		all units	unsuitable — subject to flooding	
Athletic fields		all units	suitable — permanently wet	
Outdoor living	tent and trailer parks	all units	unsuitable — permanently wet	
	picnic areas	all units	unsuitable — permanently wet	

Soil unit: IN8

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe	Erosion hazards	all units	slight to none
Equipment limitations	all units	severe	Windthrow hazards	all units	severe
Species suitability	black spruce,* balsam fir*		Capability class	6^{w}_{bs}	

*Species of limited suitability.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
poor	unsuitable	unsuitable	poor to unsuitable

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	permeable subsoil; permanently wet
Pond embankment	subsoil has medium to low shear strength, medium compressibility, medium compacted permeability, fair to poor compaction characteristics
Drainage	permanently wet; permeable subsoil; frequent flooding
Sprinkler irrigation	permanently wet; needs drainage first
Road location	permanently wet; potentially erodible; frequent flooding; susceptible to frost damage

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–30	1.00–1.30	—	—	0%	25–45	40–60	10–20	>10.0	>0.20	5.0–6.0
30+	1.30–1.55	ML	A–4	0%	25–45	40–60	10–20	>5.0	>0.20	5.0–6.0

Kouchibouguac Association

Soil units: KO1, KO2 **Area: 47 ha**

Description of soil

These are predominantly rapidly drained, deep, olive brown, acid, sandy-textured soils, very low in natural fertility, which have formed in loose glacial marine deposits derived mainly from gray green sandstone. A moderately to strongly cemented, discontinuous ortstein or hardpan layer 10–30 cm thick occurs over about 30–60% of the soil area at a depth of 20–30 cm from the mineral soil surface. While the ortstein is impenetrable by roots, it is slowly permeable by water. That surface soil free of ortstein formation is loose and rapidly permeable, as is the subsoil. Soil texture grades from a loamy sand to sandy loam surface soil into a sand (to loamy sand) subsoil. Coarse fragments (gravel) are few — usually less than 2%. These soils usually occupy crests and upper slope positions in an undulating to almost level landscape and are typically found near the coast.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c,d	severe — depth to compact layer; droughtiness;[1] fertility	4DMF
		e	severe — depth to compact layer; droughtiness;[1] fertility; slope	
Vegetable crops		all units	unsuitable — depth to compact layer	
Septic tanks		all units	unsuitable — subsoil permeability	
Housing	with basement	a,b,c,d	slight to none — few or no adverse conditions	
		e	moderate — slope	
	without basement	a,b,c,d	slight to none — few or no adverse conditions	
		e		
Sanitary landfill (area-type)		all units	unsuitable — subsoil permeability	
Local roads and streets		a,b,c	slight to none — few or nor adverse conditions	
		d,e	moderate — slope	
Athletic fields		a,b,c	severe — droughtiness[1]	
		d	severe — droughtiness;[1] slope	
		e	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c,d	severe — droughtiness[1]	
		e	severe — droughtiness;[1] slope	
	picnic areas	all units	severe — droughtiness[1]	

Note: These soils are ortstein phases of the rapidly drained member of the Richibucto association.

[1]Droughtiness may not be a severe problem where plowed layers have incorporated sufficient organic matter into the surface mineral soil to increase water-holding capacity.

Soil units: KO1, KO2

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	a,b,c d,e	slight to none moderate	Erosion hazards	a,b,c,d e	slight to none moderate
Equipment limitations	a,b,c,d e	slight to none moderate	Windthrow hazards	all units	slight to none moderate
Species suitability	jack pine, red pine		Capability class	5^{M}_{F} jp^{D}	

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
poor	good to fair	unsuitable	good

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	rapidly permeable subsoil
Pond embankment	sandy material; subsoil has medium shear strength, low compressibility high compact permeability, good compaction characteristic
Drainage	not needed
Sprinkler irrigation	very good infiltration rate but very low water-holding capacity; where present, ortstein layer at 20–30 cm deep will delay downward movement of water
Road location	cuts and fill necessary on d-slopes and steeper; easily worked material (ortstein presents little problem)

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–25	1.20–1.40	—	—	<2	75–95	5–15	2–10	>25.0	0.08–0.12	4.0–5.0
ortstein	1.45–1.55	—	—	<2	75–95	5–15	2–10	0.1–1.0	—	4.0–5.0
45+	1.40–1.55	SP	A–3	<2	85–95	2–10	2–5	>25.0	<0.10	4.0–5.0

Soil units: KO3, KO4, KO5 **Area: 197 ha**

Description of soil

These are predominant imperfectly drained, deep, olive brown, acid, sandy-textured soils, very low in natural fertility, which have formed in loose glacial marine deposits derived mainly from gray green sandstone. A strongly cemented, discontinuous ortstein or hardpan layer 20–45 cm thick occurs over about 50–90% of the horizontal soil area at a depth of 20–30 cm from the mineral soil surface. While the ortstein is impenetrable by roots, it is slowly permeable by water. That surface soil free of ortstein formation and the subsoil are loose and rapidly permeable. Soil texture grades from a loamy sand to sandy loam surface soil into a sand (to loamy sand) subsoil. Coarse fragments (gravel) are few — usually less than 2%. These soils usually occupy areas on the edges of depressions and lower slope positions in an undulating to nearly level landscape and are typically found near the coast.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	severe — depth to compact layer (and seasonal wetness)	4DW
Vegetable crops		all units	unsuitable — depth to compact layer	
Septic tanks		all units	unsuitable — subsoil permeability	
Housing	with basement	all units	severe — seasonal wetness	
	without basement	a,b,c,d	moderate — seasonal wetness	
		e	moderate — seasonal wetness; slope	
Sanitary landfill (area-type)		all units	unsuitable — subsoil permeability	
Local roads and streets		a,b,c	moderate — seasonal wetness	
		d,e	moderate — seasonal wetness; slope	
Athletic fields		a,b	moderate — seasonal wetness-droughtiness; surface texture if loamy sand	
		c	moderate — seasonal wetness-droughtiness; surface texture if loamy sand; slope	
		d	severe — slope	
		e	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c	moderate — seasonal wetness-droughtiness; surface texture if loamy sand	
		d	moderate — seasonal wetness-droughtiness; surface texture if loamy sand; slope	
		e	severe — slope	
	picnic areas	a,b,c,d	moderate — seasonal wetness-droughtiness; surface texture if loamy sand	
		e	moderate — seasonal wetness-droughtiness; surface texture if loamy sand; slope	

Note: These soils are ortstein phases of the imperfectly drained member of the Richibucto association.

Soil units: KO3, KO4, KO5

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	moderate	Erosion hazards	a,b,c,d e	slight to none moderate
Equipment limitations	a,b,c,d e	slight to none moderate	Windthrow hazards	all units	slight to none moderate
Species suitability	jack pine, red pine, spruce balsam fir		Capability class	KO3, KO4 – 5^{E}_{D}	KO5 – $\frac{5^{E}_{W}}{bs^{D}}$

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
unsuitable	good to fair	unsuitable	good

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	rapidly permeable subsoil
Pond embankment	sandy subsoil; subsoil has medium shear strength, low compressibility, high compacted permeability, good compaction characteristics
Drainage	ortstein interferes with natural downward movement of water and with tile laying; seasonal wetness
Sprinkler irrigation	seasonal wetness; ortstein interferes with natural downward movement of water
Road location	seasonal wetness

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–25	1.20–1.40	—	—	<2	75–95	5–15	2–10	>25.0	0.08–0.12	4.0–5.0
ortstein	1.45–1.65	—	—	<2	75–95	5–15	2–10	0.1–1.0	—	4.0–5.0
55+	1.40–1.55	SP	A-3	<2	85–95	2–10	2–5	>25.0	<0.10	4.0–5.0

Soil units: KO6, KO7, KO8 **Area: 545 ha**

Description of soil

These are predominantly poorly and very poorly drained, deep, olive brown, acid, sandy-textured soils, very low in natural fertility, which have formed in loose glacial marine deposits derived mainly from gray green sandstone. A very strongly cemented, discontinuous ortstein or hardpan layer 30–60 cm thick occurs over almost the entire (more than 90%) horizontal soil area at a depth of 20–30 cm from the mineral soil surface. Although the ortstein is impenetrable to roots, it is slowly permeable to water. That surface soil free of ortstein formation and the subsoil are loose and rapidly permeable. Soil texture grades from a loamy sand to sandy loam surface soil into a sand (to loamy sand) subsoil. Coarse fragments (gravel) are few — usually less than 2%. These soils usually occupy depressions and lower slope positions in an almost level to undulating landscape and are typically found near the coast.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	unsuitable — depth to compact layer and excessive wetness	5DW
Vegetable crops		all units	unsuitable — depth to compact layer and excessive wetness	
Septic tanks		all units	unsuitable — subsoil permeability with prolonged or permanent wetness	
Housing	with basement	all units	severe (KO6) — prolonged wetness unsuitable (KO7, KO8) — prolonged or permanent wetness	
	without basement	all units	severe (KO6, KO7) — prolonged wetness unsuitable (KO8) — permanent wetness	
Sanitary landfill (area-type)		all units	unsuitable — prolonged or permanent wetness; subsoil permeability	
Local roads and streets		all units	severe — prolonged or permanent wetness	
Athletic fields		all units	severe (KO6, KO7) — prolonged wetness unsuitable (KO8) — permanent wetness	
Outdoor living	tent and trailer parks	all units	severe (KO6, KO7) — prolonged wetness unsuitable (KO8) — permanent wetness	
	picnic areas	all units	severe (KO6, KO7) — prolonged wetness unsuitable (KO8) — permanent wetness	

Note: These soils are ortstein phases of the poorly and very poorly drained member of the Richibucto association.

Soil units: KO6, KO7, KO8

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe	Erosion hazards	all units	slight to none
Equipment limitations	all units	moderate-severe	Windthrow hazards	all units	moderate-severe
Species suitability	black spruce, balsam fir		Capability class	6W bs	

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
unsuitable	poor	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	prolonged or permanent wetness; subsoil is rapidly permeable, but ortstein layer in surface soil restricts downward movement of water
Pond embankment	sandy subsoil; subsoil has medium shear strength, low compressibility, high compacted permeability, good compaction characteristics
Drainage	prolonged or permanent wetness; ortstein interferes with downward movement of water and with tile laying; outlets may be difficult to find
Sprinkler irrigation	prolonged or permanent wetness
Road location	seasonal wetness

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–25	1.20–1.40	—	—	<2	75–95	5–15	2–10	>25.0	0.08–0.12	4.0–5.0
ortstein	1.45–1.65	—	—	<2	75–95	5–15	2–10	0.1–0.5	—	4.0–5.0
70+	1.40–1.55	SP	A-3	<2	85–95	2–10	2–5	>25.0	<0.10	4.0–5.0

Lord and Foy Association

Soil units: LF1, LF2 **Area: 202 ha**

Description of soil

These are predominantly very rapidly drained, deep, olive brown, acid, cobble soils, very low in natural fertility, which have formed in loose glacial outwash deposits derived mainly from gray green sandstone. The entire depth of the soil (greater than 100 cm) consists of a loose, rapidly permeable material, which grades from a loamy sand to very gravelly or cobbly loamy sand surface texture into a very cobbly sandy subsoil. These soils usually have 50–80% coarse fragments of rounded, soft sandstone, most of which are of cobble size. Most often these soils are associated with such distinctive landforms as kames and eskers; however, they are also found in outwash plains. Typically they are close to flowing water, but not necessarily, because some have been deposited by ancient rivers that have since ceased to exist.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c,d	severe — droughtiness; fertility	4MF
		e	severe — droughtiness; fertility; slope	7T
		f	unsuitable — slope	
Vegetable crops		all units	unsuitable — combined effect of droughtiness, fertility problems, and coarse fragments	
Septic tanks		all units	unsuitable — permeability is too rapid	
Housing	with basement	a,b,c,d	slight to none — few or no adverse conditions	
		e	moderate — slope	
		f	severe — slope	
	without basement	a,b,c,d	slight to none — few or no adverse conditions	
		e	moderate — slope	
		f	severe — slope	
Sanitary landfill (area-type)		all units	unsuitable — permeability is too rapid	
Local roads and streets		a,b,c	slight to none — few or no adverse conditions	
		d,e	moderate — slope	
		f	severe — slope	
Athletic fields		a,b,c	severe — droughtiness; coarse fragments	
		d	severe — droughtiness; coarse fragments; slope	
		e,f	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c,d	severe — droughtiness	
		e	severe — droughtiness	
		f	unsuitable — slope	
	picnic areas	a,b,c,d,e	severe — droughtiness	
		f	severe — droughtiness; slope	

Soil units: LF1, LF2

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	a,b,c d,e f	slight to none moderate severe	Erosion hazards	a,b,c,d,e f	slight to none moderate
Equipment limitations	a,b,c,d e,f	slight to none moderate	Windthrow hazards	all units	slight to none
Species suitability	jack pine, red pine		Capability class	5^{F}_{M} jp	

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
poor to unsuitable	poor to unsuitable	unsuitable to poor	good

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	very rapidly permeable subsoil; usually deep deposits; not suitable for reservoir area
Pond embankment	subsoil has high shear strength, low compressibility, high compacted permeability, good compaction characteristics
Drainage	not needed
Sprinkler irrigation	very good infiltration rate but very low water-holding capacity; very rapidly permeable subsoil
Road location	easily worked; stable; cuts and fill necessary on d-slopes and steeper

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	1.20–1.40	—	—	15–50	75–95	5–15	2–10	>25.0	>0.10	4.0–5.0
40+	1.40–1.55	GP	A-1	50–90	85–95	2–10	2–5	>25.0	>0.10	4.0–5.0

Mount Hope Association

Soil unit: MH2 **Area: 2961 ha**

Description of soil

These are predominantly moderately well drained, deep, dark red, acid, clayey-textured soils, low in natural fertility, which have formed in compact reworked glacial marine deposits derived mainly from red shale and lesser amounts of gray green sandstone. Usually, these soils have 30–45 cm of relatively loose, permeable sandy loam to clay loam surface material over a dense compact, very slowly permeable clay loam to silty clay loam or even silty clay subsoil. Coarse fragments of soft sandstone are sparsely scattered at random throughout the soil, from 2 to 5% in abundance. These soils commonly occupy upper slope positions in undulating to gently rolling landscape associated with or close to tidal rivers.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c,d	moderate — shallow depth to compact layer; slowly permeable subsoil	3D
		e	severe — slope	4DT
Vegetable crops		all units	severe — shallow depth to compact layer; very slowly permeable subsoil; surface texture is clay loam	
Septic tanks		all units	severe — very slow subsoil permeability	
Housing	with basement	a,b,c,d	moderate — seasonal wetness; potential frost damage	
		e	moderate — seasonal wetness; slope; potential frost damage	
	without basement	a,b,c,d	moderate — potential frost damage	
		e	moderate — slope; potential frost damage	
Sanitary landfill (area-type)		a,b,c,d	moderate — seasonal wetness; subsoil texture (severe if subsoil texture is silty clay)	
		e	moderate — seasonal wetness; slope; subsoil texture (severe if subsoil texture is silty clay)	
Local roads and streets		all units	severe — subgrade suitability	
Athletic fields		a,b	moderate — potential frost damage; surface texture if clay loam	
		c	moderate — potential frost damage; slope; surface texture if clay loam	
		d	severe — slope	
		e	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c	slight to none — few or no adverse conditions; downgrade to moderate if clay loam surface texture	
		d	moderate — slope	
		e	severe — slope	
	picnic areas	a,b,c,d	slight to none — few or no adverse conditions; downgrade to moderate if clay loam surface texture	
		e	moderate — slope	

Soil unit: MH2

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	a,b,c,d,e	moderate	Erosion hazards	a,b,c d e	slight to none moderate severe
Equipment limitations	a,b,c,d e	slight to none moderate	Windthrow hazards	all units	moderate
Species suitability	black spruce, balsam fir, white spruce		Capability class	4D bs	

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair (poor if e-slope)	unsuitable	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	30–45 cm to an extremely slowly permeable layer; d-slopes may affect storage capacity
Pond embankment	subsoil has medium to low shear strength, medium compressibility, low compacted permeability, fair to good compaction characteristics, clayey material is difficult to work
Drainage	speeds up drying in the spring; extremely slowly permeable subsoil at 30–45 cm deep
Sprinkler irrigation	good available water-holding capacity; fair infiltration; 30–45 cm of permeable surface soil over extremely slowly permeable subsoil
Road location	potentially erodible subsoil; potential frost damage; clayey material is difficult to work; cuts and fills necessary on d-slopes and steeper

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	0.90–1.20	—	—	2–5	30–70	15–40	10–30	>5.0	0.20–0.25	4.0–5.0
40+	1.70–1.90	CL	A–6	2–5	15–40	30–50	35–55	0.1	0.10	4.5–6.0

Soil units: MH3, MH4, MH5 **Area: 5232 ha**

Description of soil

These are predominantly imperfectly drained, deep, dark red, acid, clayey-textured soils, low in natural fertility, which have formed in compact reworked glacial marine deposits derived mainly from red shale and less amounts of gray green sandstone. Usually these soils have 30–45 cm of relatively loose, permeable sandy loam to clay loam surface material over a dense, compact, very slowly permeable clay loam to silty clay loam or even silty clay subsoil. Coarse fragments of soft sandstone are sparsely scattered at random throughout the soil, from 2 to 5% in abundance. These soils commonly occupy middle to lower slope positions or areas on the edges of depressions in undulating to gently rolling landscapes associated with or close to tidal rivers.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	severe — shallowness to compact layer; very slowly permeable subsoil; seasonal wetness	4DW
Vegetable crops		all units	severe — depth to compact layer; very slowly permeable subsoil; seasonal wetness	
Septic tanks		all units	severe — very slowly permeable subsoil; seasonal wetness	
Housing	with basement	all units	severe — seasonal wetness	
	without basement	a,b,c,d	moderate — seasonal wetness; potential frost damage	
		e	moderate — seasonal wetness; slope; potential frost damage	
Sanitary landfill (area-type)		all units	moderate — seasonal wetness; severe if subsoil texture is silty clay	
Local roads and streets		all units	severe — subgrade suitability associated with seasonal wetness and potential frost damage	
Athletic fields		a,b	moderate — seasonal wetness; surface texture if clay loam; potential frost damage	
		c	moderate — seasonal wetness; slope; surface texture if clay loam; potential frost damage	
		d	severe — slope	
		e	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c	moderate — seasonal wetness; surface texture if clay loam	
		d	moderate — seasonal wetness; slope; surface texture if clay loam	
		e	severe — slope	
	picnic areas	a,b,c,d	moderate — seasonal wetness; surface texture if clay loam	
		e	moderate — seasonal wetness; slope; surface texture if clay loam	

Soil units: MH3, MH4, MH5

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	a,b,c,d,e	moderate (severe)	Erosion hazards	a,b,c d e	slight to none moderate severe
Equipment limitations	all units	moderate (severe)	Windthrow hazards	all units	moderate
Species suitability	black spruce, balsam fir, white spruce*		Capability class	MH3, MH4 – $\frac{4^{D}_{W}}{bs}$	MH5 – $\frac{5^{W}_{D}}{bs}$

*Species of limited suitability.
Note: Parentheses indicate seasonal variation.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair (poor if e-slope)	unsuitable	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	30–45 cm to a very slowly permeable layer; d-slopes may affect storage capacity; seasonal wetness
Pond embankment	subsoil has medium to low shear strength, medium compressibility, low compacted permeability, fair to good compaction characteristics, clayey material is difficult to work
Drainage	seasonal wetness; 30–45 cm of permeable surface soil over an extremely slowly permeable subsoil
Sprinkler irrigation	seasonal wetness
Road location	potentially erodible subsoil; potential frost damage; clayey material is difficult to work; cuts and fill necessary on d-slopes and steeper; seasonal wetness

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	0.90–1.20	—	—	2–5	30–70	15–40	10–30	>5.0	0.20–0.25	4.0–5.0
40+	1.70–1.90	CL	A–6	2–5	15–40	30–50	35–55	0.1	0.10	4.5–6.0

Soil units: MH6, MH7 Area: 5063 ha

Description of soil

These are predominantly poorly drained, deep, dark red, acid, clayey-textured soils, low in natural fertility, which have formed in compact reworked glacial marine deposits derived mainly from red shale and lesser amounts of gray green sandstone. As a rule, these soils have 30–45 cm of relatively loose, permeable sandy loam to clay loam surface material over a dense compact, very slowly permeable clay loam to silty clay loam or even silty clay subsoil. Coarse fragments of soft sandstone are sparsely scattered at random throughout the soil, from 2 to 5% in abundance. These soils commonly occupy depressions or lower slope positions in undulating to gently rolling landscapes associated with or close to tidal rivers.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	unsuitable — combined effect of excessive wetness, shallowness to compact layer and very slow permeability	5WD
Vegetable crops		all units	unsuitable — combined effect of excessive wetness, shallowness to compact layer and very slow permeability	
Septic tanks		all units	severe — prolonged wetness; very slowly permeable subsoil	
Housing	with basement	all units	severe — prolonged wetness	
	without basement	all units	severe — prolonged wetness	
Sanitary landfill (area-type)		all units	moderate — prolonged wetness; severe if subsoil texture is silty clay	
Local roads and streets		all units	severe — prolonged wetness; subgrade suitability	
Athletic fields		all units	severe — prolonged wetness	
Outdoor living	tent and trailer parks	all units	severe — prolonged wetness	
	picnic areas	all units	severe — prolonged wetness	

Soil units: MH6, MH7

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe	Erosion hazards	a,b,c d e	slight to none moderate severe
Equipment limitations	all units	severe	Windthrow hazards	all units	severe to moderate
Species suitability	black spruce, balsam fir		Capability class	MH6 – $\frac{5W}{bs}_{D}$	MH7 – $\frac{6W}{bs}$

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
poor to fair	unsuitable	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	prolonged wetness; 30–45 cm of permeable surface soil over very slowly permeable subsoil
Pond embankment	subsoil has medium to low shear strength, medium compressibility, low compacted permeability, fair to good compaction characteristics, clayey material is difficult to work
Drainage	prolonged wetness; 30–45 cm of permeable surface soil over a very slowly permeable subsoil; outlets may be difficult to find
Sprinkler irrigation	prolonged wetness
Road location	potentially erodible subsoil; potential frost damage; clayey material is difficult to work; prolonged wetness

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–35	0.90–1.20	—	—	2–5	30–70	15–40	10–30	>5.0	0.20–0.25	4.0–5.0
35+	1.70–1.90	CL	A–6	2–5	15–40	30–50	35–55	0.1	0.10	4.5–6.0

Reece Association

Soil unit: RE2 **Area: 7524 ha**

Description of soil

These are predominantly well drained, deep, yellowish brown, acid, fine-textured soils, low in natural fertility, which have formed in deposits of compact till with a surficial mantle of either loose till or water-worked till, derived mainly from gray green sandstone and brown shale. These soils consist of 45–60 cm of relatively loose, permeable, sandy loam to loam material over a moderately developed firm, brittle, slowly permeable, noncontinuous, sandy loam to sandy clay loam fragipan (hardpan) that is 40–60 cm thick. Firmness of the fragipan is dependent on moisture content; it is most obvious in summer, but in the wetness of early spring and late fall it is hard to differentiate from the underlying dense, compact, slowly permeable sandy clay loam subsoil. Coarse fragments of soft sandstone make up 5–25%, usually increasing in abundance with depth. These soils usually occupy crests or upper slope positions in an undulating to almost level landscape.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c	moderate — depth to compact layer; slow permeability	3D
		d	moderate — depth to compact layer; slow permeability; slope	
Vegetable crops		a,b	moderate — depth to compact layer; slow permeability; surface coarse fragments	
		c	moderate — depth to compact layer; slow permeability; slope; surface coarse fragments	
		d	severe — slope	
Septic tanks		all units	severe — slow permeability	
Housing	with basement	all units	moderate — potential frost damage	
	without basement	all units	moderate — potential frost damage	
Sanitary landfill (area-type)		all units	moderate — seasonal wetness; true groundwater table	
Local roads and streets		a,b,c	moderate — subgrade suitability; potential frost damage	
		d	moderate — slope; subgrade suitability; potential frost damage	
Athletic fields		a,b	moderate — potential frost damage; surface coarse fragments	
		c	moderate — slope; potential frost damage; surface coarse fragments	
		d	severe — slope	
Outdoor living	tent and trailer parks	a,b,c	slight to none — few or no adverse conditions	
		d	moderate — slope	
	picnic areas	all units	slight to none — few or no adverse conditions	

Soil unit: RE2

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	a,b,c	slight to none	Erosion hazards	a,b,c	slight to none
	d	(moderate) moderate		d	moderate
Equipment limitations	a,b,c,d	slight to none	Windthrow hazards	all units	slight to none
Species suitability	black spruce, balsam fir, yellow birch, sugar maple,* beech,* yellow birch, white spruce*		Capability class	3^{F}_{bs}	

*Species of limited suitability.
Note: Parentheses indicate seasonal variation.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair (depending on coarse fragments)	unsuitable	unsuitable	fair

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	45–60 cm to slowly permeable layer; d-slopes may affect storage capacity
Pond embankment	subsoil has medium to low shear strength, low to medium compressibility medium to low compacted permeability, fair to good compaction characteristics, 10–25% coarse fragments (soft sandstone)
Drainage	usually not needed but aids drying out in the spring; 45–60 cm of permeable material over slowly permeable layer
Sprinkler irrigation	good available water-holding capacity; good infiltration rate; 45–60 cm of permeable material over slowly permeable layer
Road location	potential frost damage; cuts and fill necessary on d-slopes

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–50	0.90–1.20	—	—	5–15	50–70	20–35	10–30	>5.0	0.20–0.25	4.0–5.0
50+	1.75–1.95	SM–SC	A–4	10–25	50–70	15–25	20–30	0.1–0.5	<0.10	4.5–5.0

Soil units: RE3, RE4, RE5 **Area: 22 856 ha**

Description of soil

These are predominantly imperfectly drained, deep, yellowish brown, acid, fine-textured soils, low in natural fertility, which have formed in deposits of compact till with a surficial mantle of either loose till or water-worked compact till, derived mainly from gray green sandstone and brown shale. These soils consist of 30–50 cm of relatively loose, permeable, sandy loam to loam material over a moderately developed, firm and brittle (when dry), slowly permeable, noncontinuous sandy loam to sandy clay loam fragipan (hardpan) that is 35–55 cm thick. Firmness of the fragipan is dependent on moisture content; it is most obvious in midsummer, but in the wetness of spring and fall it is hard to differentiate from the underlying dense, compact, slowly permeable sandy clay loam subsoil. Coarse fragments of soft sandstone make up 5–25%, usually increasing in abundance with depth. These soils usually occupy areas on the edges of depressions and middle to lower slope positions in an undulating to almost level landscape.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	severe — depth to compact layer (associated with permeability, fertility, and seasonal wetness problems)	4DW
Vegetable crops		all units	severe — depth to compact layer (associated with permeability fertility, and seasonal wetness problems)	
Septic tanks		all units	severe — slow permeability; seasonal wetness	
Housing	with basement	all units	severe — seasonal wetness	
	without basement	all units	moderate — seasonal wetness; potential frost damage	
Sanitary landfill (area-type)		all units	severe — seasonal wetness (true groundwater table)	
Local roads and streets		a,b,c	moderate — seasonal wetness; subgrade suitability; potential frost damage	
		d	moderate — seasonal wetness; slope; subgrade suitability potential frost damage	
Athletic fields		a,b	moderate — seasonal wetness; potential frost damage; surface coarse fragments	
		c	moderate — seasonal wetness; slope; potential frost damage, surface coarse fragments	
		d	severe — slope	
Outdoor living	tent and trailer parks	a,b,c	moderate — seasonal wetness	
		d	severe — seasonal wetness; slope	
	picnic areas	all units	moderate — seasonal wetness	

Soil units: RE3, RE4, RE5

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	moderate	Erosion hazards	a,b,c d	slight to none moderate
Equipment limitations	all units	moderate	Windthrow hazards	all units	moderate
Species suitability	black spruce, balsam fir, yellow birch, sugar maple,* beech,* yellow birch, white spruce*		Capability class	4D bs	

*Species of limited suitability.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair (depending on coarse fragments)	unsuitable	unsuitable	fair

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	30–50 cm to slowly permeable layer; seasonal wetness; d-slope may affect storage capacity
Pond embankment	subsoil has medium to low shear strength, low to medium compressibility, medium to low compacted permeability, fair to good compaction characteristics, 10–25% coarse fragments (soft sandstone)
Drainage	seasonal wetness; 30–50 cm of permeable material over a slowly permeable layer; stones may hinder tiling
Sprinkler irrigation	seasonal wetness; 30–50 cm of permeable material over slowly permeable layer
Road location	seasonal wetness; potential frost damage; cuts and fill necessary on d-slopes

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	0.90–1.20	—	—	5–15	50–70	20–35	10–30	>5.0	0.20–0.25	4.0–5.0
40+	1.75–1.95	SM–SC	A–4	10–25	50–70	15–25	20–30	0.1–0.5	<0.10	4.5–5.0

Soil units: RE6, RE7 Area: 32 078 ha

Description of soil

These are predominantly poorly drained, deep, yellowish brown, acid, fine-textured soils, low in natural fertility, which have formed in deposits of compact till with a surficial mantle of either loose till or water-worked compact till, derived mainly from gray green sandstone and brown shale. These soils consist of 20–35 cm of relatively loose, permeable, sandy loam to loam material over a weakly developed, firm, brittle (when dry), slowly permeable noncontinuous, sandy loam to sandy clay loam fragipan (hardpan) that is 20–40 cm thick. Firmness of the fragipan is dependent on moisture content and so with the off-drainage of these soils, the fragipan is hard to differentiate from the underlying dense, compact, slowly permeable sandy clay loam subsoil. Coarse fragments of soft sandstone make up 5–25%, usually increasing in abundance with depth. These soils usually occupy depressions and lower slope positions in an undulating to almost level landscape.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	unsuitable — combined effects of shallowness to compact layer and excessive wetness	5DW
Vegetable crops		all units	unsuitable — combined effects of shallowness to compact layer and excessive wetness	
Septic tanks		all units	severe — slow permeability; prolonged wetness	
Housing	with basement	all units	severe — prolonged wetness; potential frost damage	
	without basement	all units	severe — prolonged wetness; potential frost damage	
Sanitary landfill (area-type)		all units	severe — prolonged wetness; true groundwater table	
Local roads and streets		all units	severe — prolonged wetness; potential frost damage	
Athletic fields		all units	severe — prolonged wetness; potential frost damage	
Outdoor living	tent and trailer parks	all units	severe — prolonged wetness	
	picnic areas	all units	severe — prolonged wetness	

Soil units: RE6, RE7

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe	Erosion hazards	all units	slight to none
Equipment limitations	all units	moderate (severe)	Windthrow hazards	all units	moderate-severe
Species suitability	black spruce, balsam fir		Capability class	5^{W}_{D} bs	

Note: Parentheses indicate seasonal variation.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair (depending on coarse fragments)	unsuitable	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	20–35 cm to slowly permeable layer; prolonged wetness
Pond embankment	subsoil has medium to low shear strength, low to medium compressibility, medium to low compacted permeability, fair to good compaction characteristics, 10–25% coarse fragments (soft sandstone)
Drainage	prolonged wetness; 20–35 cm to slowly permeable layer; stones may hinder tiling; outlets may be difficult to find
Sprinkler irrigation	prolonged wetness
Road location	prolonged wetness; potential frost damage

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–30	0.90–1.20	—	—	5–15	50–70	20–35	10–30	>5.0	0.20–0.25	4.0–5.0
30+	1.75–1.95	SM–SC	A–4	10–25	50–70	15–25	20–35	0.1–0.5	<0.10	4.5–5.0

Richibucto Association

Soil units: RB1, RB2 **Area: 4182 ha**

Description of soil

These are predominantly rapidly drained, deep, olive brown, acid, sandy-textured soils, very low in natural fertility, which have formed in loose, glacial marine deposits derived mainly from gray green sandstone. The entire depth of the soil (greater than 100 cm) consists of a loose, rapidly permeable material, which grades from a sand to sandy loam surface texture into a sand (to loamy sand) subsoil. Usually these soils have practically no coarse fragments (less than 2%), however, gravelly phases do occur, which may have up to 20% coarse fragments of rounded, gravel size, soft sandstone. These soils usually occupy crests and upper slope positions in an undulating to almost level landscape and are typically found near the coast.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c,d	severe — droughtiness;[1] fertility	4MF
		e	severe — droughtiness;[1] fertility; slope	
Vegetable crops		a,b,c	severe — droughtiness;[1] fertility; surface texture if sand	
		d, part of e	severe — droughtiness;[1] fertility; slope; surface texture if sand	
Septic tanks		all units	unsuitable — subsoil permeability	
Housing	with basement	a,b,c,d	slight to none — few or no adverse conditions	
		e	moderate — slope	
	without basement	a,b,c,d	slight to none — few or no adverse conditions	
		e	moderate — slope	
Sanitary landfill (area-type)		all units	unsuitable — subsoil permeability	
Local roads and streets		a,b,c	slight to none — few or no adverse conditons	
		d,e	moderate — slope	
Athletic fields		a,b,c	severe — droughtiness;[1] surface texture if sand	
		d	severe — droughtiness;[1] slope; surface texture if sand	
		e	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c,d	severe — droughtiness[1]	
		e	severe — droughtiness;[1] slope	
	picnic areas	all units	severe — droughtiness[1]	

[1]Droughtiness may not be a severe problem where plowed layers have incorporated sufficient organic matter into the surface mineral soil to increase water-holding capacity.

Soil units: RB1, RB2

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	a,b,c d,e	slight to none moderate	Erosion hazards	a,b,c,d e	slight to none moderate
Equipment limitations	a,b,c,d e	slight to none moderate	Windthrow hazards	all units	slight to none
Species suitability	jack pine, red pine, eastern white pine*		Capability class	$\frac{5^M_F}{jp}$	

*Species of limited suitability.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
poor (fair if sandy loam)	good	unsuitable	good

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	rapidly permeable subsoil
Pond embankment	sandy material; subsoil has medium shear strength, low compressibility, high compacted permeability, good compaction characteristics
Drainage	not needed
Sprinkler irrigation	very good infiltration rate but very low water-holding capacity; readily permeable subsoil
Road location	easily worked; cuts and fill necessary on d-slopes and steeper

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	1.20–1.40	—	—	<2	75–95	5–15	2–10	>25.0	0.08–0.12	4.0–5.0
40+	1.40–1.55	SP	A-3	<2	85–97	2–10	2–5	>25.0	<0.10	4.0–5.0

Soil units: RB3, RB4, RB5 Area: 6724 ha

Description of soil

These are predominantly imperfectly drained, deep, olive brown, acid, sandy-textured soils, very low in natural fertility, which have formed in loose glacial marine deposits derived mainly from gray green sandstone. The entire depth of the soil (greater than 100 cm) consists of a loose, rapidly permeable material, which grades from a sand to sandy loam surface texture into a sand (to loamy sand) subsoil. Usually these soils have practically no coarse fragments (less than 2%), however, gravelly phases do occur, which may have up to 20% coarse fragments of rounded, gravel size, soft sandstone. These soils usually occupy areas in the edges of depressions and lower slope positions in a slightly undulating to almost level landscape and are typically found near the coast.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c,d	severe — fertility; seasonal wetness; possibly droughty in summer	4FW
		e	severe — fertility; seasonal wetness; slope; possibly droughty in summer	
Vegetable crops		a,b,c	severe — fertility; seasonal wetness; surface texture if sand; possibly droughty in summer	
		d,e	severe — fertility; seasonal wetness; slope; surface texture if sand; possibly droughty in summer	
Septic tanks		all units	unsuitable — subsoil permeability	
Housing	with basement	all units	severe — seasonal wetness	
	without basement	a,b,c,d	moderate — seasonal wetness	
		e	moderate — seasonal wetness; slope	
Sanitary landfill (area-type)		all units	unsuitable — subsoil permeability	
Local roads and streets		a,b,c	moderate — seasonal wetness	
		d,e	moderate — seasonal wetness; slope	
Athletic fields		a,b	moderate — seasonal wetness-droughtiness; possibly surface texture	
		c	moderate — seasonal wetness-droughtiness; slope; possibly surface texture	
		d	severe — slope	
		e	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c	moderate — seasonal wetness-droughtiness; surface texture if sand or loamy sand	
		d	moderate — seasonal wetness-droughtiness; slope; surface texture if sand or loamy sand	
		e	severe — slope	
	picnic areas	a,b,c,d	moderate — seasonal wetness-droughtiness; surface texture if sand or loamy sand	
		e	moderate — seasonal wetness-droughtiness; slope; surface texture if sand or loamy sand	

Note: There is a tendency for these soils to be moderately wet in the spring but moderately droughty in the summer.

Soil units: RB3, RB4, RB5

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	moderate	Erosion hazards	a,b,c,d e	slight to none moderate
Equipment limitations	a,b,c,d e	slight to none moderate	Windthrow hazards	all units	slight to none
Species suitability	jack pine, red pine, eastern white pine, balsam fir, black spruce		Capability class	RB3, RB4 – 4F jp RB5 – 5^{f}_{a} bs	

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
poor (fair if sandy loam)	good	unsuitable	fair

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	rapidly permeable subsoil; seasonal wetness
Pond embankment	sandy material; subsoil has medium shear strength, low compressibility, high compacted permeability, good compaction characteristics
Drainage	rapidly permeable subsoil; seasonal wetness
Sprinkler irrigation	seasonal wetness but soil tends to dry out during summer and so irrigation may be beneficial; very good infiltration rate but very poor water-holding capacity
Road location	seasonal wetness

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	1.20–1.40	—	—	<2	75–95	5–15	2–10	>25.0	0.08–0.12	4.0–5.0
40+	1.40–1.55	SP	A–3	<2	85–97	2–10	2–5	>25.0	<0.10	4.0–5.0

Soil units: RB6, RB7 **Area: 6581 ha**

Description of soil

These are predominantly poorly drained, deep, olive brown, acid, sandy-textured soils, very low in natural fertility, which have formed in loose glacial marine deposits derived mainly from gray green sandstone. The entire depth of the soil (greater than 100 cm) consists of a loose, rapidly permeable material, which grades from a sand (to sandy loam) surface texture into a sand to loamy sand subsoil. Usually these soils have practically no coarse fragments (less than 2%), however, gravelly phases do occur, which may have up to 20% coarse fragments of rounded, gravel size, soft sandstone. These soils usually occupy depressions and lower slope positions in an almost level to slightly undulating landscape and are typically found near the coast.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	severe — excessive wetness; fertility	5WF
Vegetable crops		all units	unsuitable — excessive wetness; fertility	
Septic tanks		all units	unsuitable — subsoil permeability	
Housing	with basement	all units	severe (RG6) or unsuitable (RG7) — prolonged wetness	
	without basement	all units	severe — prolonged wetness	
Sanitary landfill (area-type)		all units	unsuitable — prolonged wetness (true groundwater table); subsoil permeability	
Local roads and streets		all units	severe — prolonged wetness	
Athletic fields		all units	severe — prolonged wetness	
Outdoor living	tent and trailer parks	all units	severe — prolonged wetness	
	picnic areas	all units	severe — prolonged wetness	

Soil units: RB6, RB7

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe	Erosion hazards	all units	slight to none
Equipment limitations	all units	moderate	Windthrow hazards	all units	moderate
Species suitability	balsam fir, black spruce		Capability class	6W bs	

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
poor (fair if sandy loam)	poor	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	prolonged wetness; rapidly permeable subsoil
Pond embankment	sandy material; subsoil has medium shear strength, low compressibility, high compacted permeability, good compaction characteristics
Drainage	prolonged wetness but rapidly permeable subsoil; outlets may be difficult to find
Sprinkler irrigation	prolonged wetness; requires drainage first; very good infiltration rate but very low water-holding capacity
Road location	prolonged wetness

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–35	1.20–1.40	—	—	<2	75–95	5–15	2–10	>25.0	0.08–0.12	4.0–5.0
35+	1.40–1.55	SP	A–3	<2	85–97	2–10	2–5	>25.0	<0.10	4.0–5.0

Soil unit: RB8 Area: 1331 ha

Description of soil

These are predominantly very poorly drained, deep, olive brown, acid, sandy-textured soils, low in natural fertility, which have formed in loose glacial marine deposits derived mainly from gray green sandstone. The entire depth of the soil (greater than 100 cm) consists of a loose, rapidly permeable material, which grades from a sand (to sandy loam) surface texture into a sand to loamy sand subsoil. Usually these soils have practically no coarse fragments (less than 2%), however, gravelly phases do occur, which may have up to 20% coarse fragments of rounded, gravel size, soft sandstone. These soils occupy depressions in an almost level to slightly undulating landscape and are typically found near the coast.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	unsuitable — permanently wet	7W
Vegetable crops		all units	unsuitable — permanently wet	
Septic tanks		all units	unsuitable — permanently wet (true groundwater table); subsoil permeability	
Housing	with basement	all units	unsuitable — permanently wet	
	without basement	all units	unsuitable — permanently wet	
Sanitary landfill (area-type)		all units	unsuitable — permanently wet (true groundwater table); subsoil permeability	
Local roads and streets		all units	severe — permanently wet	
Athletic fields		all units	unsuitable — permanently wet	
Outdoor living	tent and trailer parks	all units	unsuitable — permanently wet	
	picnic areas	all units	unsuitable — permanently wet	

Soil unit: RB8

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe	Erosion hazards	all units	slight to none
Equipment limitations	all units	severe	Windthrow hazards	all units	severe
Species suitability	black spruce.* balsam fir*		Capability class	6W bs	

*Species of limited suitability.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
poor	poor	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	permanently wet; rapidly permeable subsoil
Pond embankment	sandy material; subsoil has medium shear strength, low compressibility, high compacted permeability, good compaction characteristics
Drainage	permanently wet but rapidly permeable subsoil; outlets may be difficult to find
Sprinkler irrigation	permanently wet; requires drainage first; very good infiltration rate but very low water-holding capacity
Road location	permanently wet

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–30	1.20–1.40	—	—	<2	75–95	5–15	2–10	>25.0	0.08–0.12	4.0–5.0
30+	1.40–1.55	SP	A–3	<2	85–97	2–10	2–5	>25.0	<0.10	4.0–5.0

Riverbank Association

Soil units: R1, R2 **Area: 79 ha**

Description of soil

These are predominantly rapidly drained, deep, olive brown, acid, sandy-textured soils, low in natural fertility, which have formed in loose glacial fluvial deposits derived mainly from igneous and metamorphic rocks. The entire depth of the soil (greater than 100 cm) consists of a loose, rapidly permeable material, which grades from a (fine) loamy sand to a (fine) sandy loam surface texture into a (fine) sand to (fine) loamy sand subsoil, which is striped or banded. Usually these soils have practically no coarse fragments (less than 2%), however, gravelly phases do occur, which may have up to 20% gravel fragments of very hard, rounded granites, schists, gneisses, slates, and volcanics. Typically these soils are found on upper slope positions of river terraces and undulating outwash plains; however, some have been deposited by ancient rivers that have since ceased to exist and so are not close to any flowing water.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c	moderate — fertility; droughtiness	3M
		d	moderate — fertility; droughtiness; slope	4MT
		e	severe — slope	
Vegetable crops		a,b	moderate — fertility; droughtiness	
		c	moderate — fertility; droughtiness; slope	
		d, part of e	severe — slope	
Septic tanks		a,b,c,d	slight to none —few or no adverse conditions except for possibly a too rapid permeability; should be checked	
		e	moderate — slope	
Housing	with basement	a,b,c,d	slight to none — few or no adverse conditions (possibly frost action)	
		e	moderate — slope	
	without basement	a,b,c,d	slight to none — few or no adverse conditions (possibly frost action)	
		e	moderate — slope	
Sanitary landfill (area-type)		all units	severe — permeability too rapid	
Local roads and streets		a,b,c	slight to none — few or no adverse conditions (possibly frost action)	
		d,e	moderate — slope	
Athletic fields		a,b	moderate — droughtiness	
		c	moderate — droughtiness; slope	
		d	severe — slope	
		e	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c	moderate — droughtiness	
		d	moderate — droughtiness; slope	
		e	severe — slope	
	picnic areas	a,b,c,d	moderate — droughtiness	
		e	moderate — droughtiness; slope	

Soil units: R1, R2

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	a,b,c d,e	slight to none moderate	Erosion hazards	a,b,c d,e	slight to none moderate
Equipment limitations	a,b,c,d e	slight to none moderate	Windthrow hazards	all units	slight to none
Species suitability	jack pine, red pine, eastern white pine, black spruce, balsam fir, white spruce*		Capability class	3^{M}_{F} jp	

*Species of limited suitability.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair	good	unsuitable	fair

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	permeable subsoil
Pond embankment	subsoil has medium shear strength, low compressibility, medium compacted permeability, and good to fair compaction characteristics
Drainage	not needed
Sprinkler irrigation	very good infiltration rate, moderate water-holding capacity; permeable subsoil
Road location	easily worked; possible erosion hazards; cuts and fill necessary on d-slopes and steeper

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	1.20–1.40	—	—	<2%	70–90	5–20	2–10	>25.0	0.10–0.15	4.0–5.0
40+	1.40–1.55	SP–SM	A-3	<2%	80–95	5–20	2–10	5.0–15.0	<0.10	4.0–5.0

Soil units: R3, R4, R5 **Area: 1167 ha**

Description of soil

These are predominantly imperfectly drained, deep, olive brown, acid, sandy-textured soils, low in natural fertility, which have formed in loose glacial fluvial deposits derived mainly from igneous and metamorphic rocks. The entire depth of the soil (greater than 100 cm) consists of a loose, rapidly permeable material, which grades from a (fine) loamy sand to a (fine) sandy loam surface texture into a (fine) sand to (fine) loamy sand subsoil, which is striped or banded. Usually these soils have practically no coarse fragments (less than 2%); however, gravelly phases do occur, which may have up to 20% gravel fragments of very hard, rounded granites, schists, gneisses, slates, and volcanics. Typically these soils are found on lower slope positions of river terraces and undulating outwash plains; however, some have been deposited by ancient rivers that have since ceased to exist and so are not close to any flowing water.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c	moderate — fertility; seasonal wetness	3W
		d	moderate — fertility; seasonal wetness; slope	
Vegetable crops		a,b	moderate — fertility; seasonal wetness	
		c	moderate — fertility; seasonal wetness; slope	
		d	severe — slope	
Septic tanks		all units	severe — seasonal wetness	
Housing	with basement	all units	severe — seasonal wetness	
	without basement	a,b,c,d	moderate — seasonal wetness	
Sanitary landfill (area-type)		all units	severe — seasonal wetness; permeability too rapid	
Local roads and streets		a,b,c	moderate — seasonal wetness; possible frost action	
		d	moderate — seasonal wetness; slope; possible frost action	
Athletic fields		a,b	moderate — seasonal wetness-droughtiness; possible frost action	
		c	moderate — seasonal wetness-droughtiness; slope; possible frost action	
		d	severe — slope	
Outdoor living	tent and trailer parks	a,b,c	moderate — seasonal wetness-droughtiness	
		d	moderate — seasonal wetness-droughtiness	
	picnic areas	a,b,c,d	moderate — seasonal wetness-droughtiness	

Soil units: R3, R4, R5

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	moderate	Erosion hazards	a,b,c d	slight to none moderate
Equipment limitations	a,b,c,d	slight to none	Windthrow hazards	all units	slight to none
Species suitability	jack pine, red pine, eastern white pine, black spruce, balsam fir, white spruce*		Capability class	R3, R4 – $\frac{3F}{jp}$	R5 – $\frac{4^{w}_{r}}{bs}$

*Species of limited suitability.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair	good	unsuitable	fair

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	seasonal wetness; permeable subsoil
Pond embankment	subsoil has medium shear strength, low compressibility, medium compacted permeability, and good to fair compaction characteristics
Drainage	seasonal wetness; permeable subsoil
Sprinkler irrigation	seasonal wetness but dried out in midsummer and so irrigation may be beneficial; good infiltration rate; moderate water-holding capacity
Road location	seasonal wetness; easily worked; possible erosion hazards

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	1.20–1.40	—	—	<2%	70–90	5–20	2–10	>25.0	0.10–0.15	4.0–5.0
40+	1.40–1.55	SP–SM	S–3	<2%	80–95	5–20	2–5	5.0–1.50	<0.10	4.0–5.0

Soil units: R6, R7 **Area: 1731 ha**

Description of soil

These are predominantly poorly drained, deep, olive brown, acid, sandy-textured soils, low in natural fertility, which have formed in loose glacial fluvial deposits derived mainly from igneous and metamorphic rocks. The entire depth of the soil (greater than 100 cm) consists of a loose, rapidly permeable material, which grades from a (fine) loamy sand to a (fine) sandy loam surface texture into a (fine) sand to (fine) loamy sand subsoil, which is striped or banded. Usually these soils have practically no coarse fragments (less than 2%); however, gravelly phases do occur, which may have up to 20% gravel fragments of very hard, rounded granites, schists, gneisses, slates, and volcanics. Typically these soils are found on lowlands adjacent to rivers and in depressions on undulating outwash plains; however, some have been deposited by ancient rivers that have since ceased to exist and so are not close to any flowing water.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	severe — prolonged wetness	4W
Vegetable crops		all units	unsuitable — prolonged wetness	
Septic tanks		all units	severe — prolonged wetness; subsoil permeability is too rapid	
Housing	with basement	all units	severe — prolonged wetness; possible flooding	
	without basement	all units	severe — prolonged wetness; possible flooding	
Sanitary landfill (area-type)		all units	unsuitable — prolonged wetness; subsoil permeability is too rapid; possible flooding	
Local roads and streets		all units	severe — prolonged wetness	
Athletic fields			severe — prolonged wetness	
Outdoor living	tent and trailer parks	all units	severe — prolonged wetness	
	picnic areas	all units	severe — prolonged wetness	

Soil units: R6, R7

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe	Erosion hazards	a,b,c	slight to none
Equipment limitations	all units	moderate	Windthrow hazards	all units	moderate
Species suitability	black spruce, balsam fir		Capability class	R6 – $\frac{5W}{bs}$	R7 – $\frac{6W}{bs}$

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
poor	poor	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	prolonged wetness; permeable subsoil
Pond embankment	subsoil has medium shear strength, low compressibility, medium compacted permeability, and good to fair compaction characteristics
Drainage	prolonged wetness; permeable subsoil
Sprinkler irrigation	prolonged wetness; needs drainage first; very good infiltration rate; moderate water-holding capacity; permeable subsoil
Road location	easily worked; possible erosion hazards; potential frost action; prolonged wetness

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–30	1.20–1.40	—	—	<2%	70–90	5–20	2–10	>25.0	0.10–0.15	4.0–5.0
30+	1.40–1.55	SP–SM	A–3	<2%	80–95	5–20	2–5	5.0–15.0	<0.10	4.0–5.0

Rogersville Association

Soil unit: RS2 **Area: 926 ha**

Description of soil

These are predominantly well drained, deep, yellowish brown, acid, fine-textured soils, moderate in natural fertility, which have formed in deposits of compact till (or possibly water-reworked compact till), derived mainly from granitic, metamorphic (gneiss, schist, and others), and some volcanic rocks. These soils consist of 35–50 cm of relatively loose, permeable, sandy loam to loam material over a moderately developed, firm, brittle, slowly permeable noncontinuous, sandy loam to sandy clay loam fragipan (hardpan) that is 30–50 cm thick. Firmness of the fragipan is dependent on moisture content and therefore it is most obvious in the summer. However, in the wetness of early spring and late fall, it is difficult to differentiate from the underlying dense, compact, slowly permeable loam to sandy clay loam or clay loam subsoil. Coarse fragments of hard granitic, metamorphic, and volcanic rock make up 5–25% usually increasing in abundance with depth. These soils usually occupy crests and upper slope positions in an undulating to almost level landscape.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	moderate — depth to compact layer; slow permeability	3D
Vegetable crops		all units	severe — depth to compact layer; surface coarse fragments	
Septic tanks		all units	severe — permeability	
Housing	with basement	all units	moderate — potential frost damage; possible stoniness	
	without basement	all units	moderate — potential frost damage; possible stoniness	
Sanitary landfill (area-type)		all units	moderate — seasonal wetness; true groundwater table; possibly clay loam subsoil or stony phase	
Local roads and streets		a,b,c	moderate — subgrade suitability; potential frost damage; possibly stoniness	
		d	moderate — slope; subgrade suitability; potential frost damage; possibly stoniness	
Athletic fields		a,b	moderate — potential frost damage; coarse fragments on the surface	
		c	moderate — slope; potential frost damage; coarse fragments on the surface	
		d	severe — slope	
Outdoor living	tent and trailer parks	a,b,c	slight to none — few or no adverse conditions	
		d	moderate — slope	
	picnic areas	all units	slight to none — few or no adverse conditions	

Soil unit: RS2

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	a,b,c d	slight to none (moderate) moderate	Erosion hazards	a,b,c d	slight to none moderate
Equipment limitations	a,b,c,d	slight to none	Windthrow hazards	all units	moderate
Species suitability	white spruce, black spruce, balsam fir, sugar maple, beech, white and yellow birch		Capability class	4D bs	

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair to poor	unsuitable	unsuitable	fair

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	35–50 cm to a slowly permeable layer; d-slopes may affect storage capacity
Pond embankment	subsoil has medium to low shear strength, low to medium compressibility, low to medium compacted permeability, fair to good compaction characteristics, 15–25% coarse fragments of hard rock
Drainage	usually not needed but aids drying out in the spring; 35–50 cm of permeable material over slowly permeable layer
Sprinkler irrigation	good available water-holding capacity; good infiltration rate; 35–50 cm of permeable material over slowly permeable layer
Road location	potential frost damage; cuts and fill necessary on d-slopes

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	0.90–1.20	—	—	5–20	40–60	30–40	10–20	>5.0	0.20–0.25	4.0–5.0
40+	1.75–1.95	SM–SC	A–4	15–35	40–55	25–40	20–30	0.1–0.5	<0.10	4.5–5.5

Soil units: RS3, RS4, RS5 Area: 7151 ha

Description of soil

These are predominantly imperfectly drained, deep, yellowish brown, acid, fine-textured soils, moderate in natural fertility, which have formed in deposits of compact till (or possibly water-worked compact till), derived mainly from granitic, metamorphic (gneiss, schist, and others), and some volcanic rocks. These soils consist of 30–45 cm of relatively loose, permeable, sandy loam to loam material over a moderately developed, firm, brittle (when dry), slowly permeable noncontinuous, sandy loam to sandy clay loam fragipan (hardpan) that is 30–45 cm thick. Firmness of the fragipan is dependent on moisture content and therefore it is most obvious in midsummer. However, in the wetness of spring and fall, it is hard to differentiate from the underlying dense, compact, slowly permeable loam to sandy clay loam or clay loam subsoil. Coarse fragments of hard granitic, metamorphic, and volcanic rock range from 5 to 25%, usually increasing in abundance with depth. These soils usually occupy areas on the edges of depressions and middle to lower slope positions in an undulating to nearly level landscape.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	severe — depth to compact layer	4DW
Vegetable crops		all units	severe — depth to compact layer associated with slow permeability and seasonal wetness	
Septic tanks		all units	severe — slow permeability; seasonal wetness	
Housing	with basement	all units	severe — seasonal wetness	
	without basement	all units	moderate — potential frost damage; seasonal wetness	
Sanitary landfill (area-type)		all units	severe — seasonal wetness (true groundwater table)	
Local roads and streets		a,b,c	moderate — seasonal wetness; subgrade suitability; potential frost damage	
		d	moderate — seasonal wetness; slope; subgrade suitability; potential frost damage	
Athletic fields		a,b	moderate — seasonal wetness; potential frost damage; surface coarse fragments	
		c	moderate — seasonal wetness; slope; potential frost damage; surface coarse fragments	
		d	severe — slope	
Outdoor living	tent and trailer parks	a,b,c	moderate — seasonal wetness	
		d	moderate — seasonal wetness; slope	
	picnic areas	all units	moderate — seasonal wetness	

Soil units: RS3, RS4, RS5

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	moderate	Erosion hazards	a,b,c d	slight to none moderate
Equipment limitations	all units	moderate	Windthrow hazards	all units	moderate
Species suitability	black spruce, balsam fir, yellow birch, white spruce*		Capability class	RS3 – $\frac{4D}{bs}$	RS4, RS5 – $\frac{4D}{bs}$

*Species of limited suitability.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair to poor	unsuitable	unsuitable	fair

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	30–45 cm to slowly permeable layer; seasonal wetness; d-slopes may affect storage capacity
Pond embankment	subsoil has medium to low shear strength, low to medium compressibility, low to medium compacted permeability, fair to good compaction characteristics, 15–25% coarse fragments of hard rock
Drainage	seasonal wetness; 30–45 cm of permeable material over slowly permeable layer; stones may hinder tiling
Sprinkler irrigation	seasonal wetness; 30–45 cm of permeable material over slowly permeable layer
Road location	seasonal wetness; potential frost damage; cuts and fill necessary on d-slopes

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	0.90–1.20	—	—	5–20	40–60	30–40	10–25	>5.0	0.20–0.25	4.0–5.0
40+	1.75–1.95	SM–SC	A–4	15–35	40–55	25–40	20–30	0.1–0.5	<0.10	4.5–5.5

Soil units: RS6, RS7 Area: 19 412 ha

Description of soil

These are predominantly poorly drained, deep, yellowish brown, acid, fine-textured soils, moderate in natural fertility, which have formed in deposits of compact till (or possibly water-worked compact till), derived mainly from granitic, metamorphic (gneiss, schist, and others), and some volcanic rocks. These soils consist of 20–35 cm of relatively loose, permeable sandy loam to loam material over a weakly developed, firm, brittle (when dry), slowly permeable, noncontinuous, sandy loam to sandy clay loam fragipan (hardpan) that is 20–40 cm thick. Firmness of the fragipan is dependent on moisture content and so with the off-drainage of these soils, the fragipan is hard to differentiate from the underlying dense, compact, slowly permeable loam to sandy clay loam or clay loam subsoil. Coarse fragments of hard granitic, metamorphic, and volcanic rock make up 5–25% usually increasing in abundance with depth. These soils usually occupy depressions and lower slope positions in an undulating to almost level landscape.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	unsuitable — shallow depth to a slowly permeable layer in combination with excessive wetness	5DW
Vegetable crops		all units	unsuitable — shallow depth to a slowly permeable layer in combination with excessive wetness	
Septic tanks		all units	severe — prolonged wetness; slow permeability	
Housing	with basement	all units	severe — prolonged wetness; potential frost damage	
	without basement	all units	severe — prolonged wetness; potential frost damage	
Sanitary landfill (area-type)		all units	severe — prolonged wetness (true groundwater table)	
Local roads and streets		all units	severe — prolonged wetness; potential frost damage	
Athletic fields		all units	severe — prolonged wetness; potential frost damage	
Outdoor living	tent and trailer parks	all units	severe — prolonged wetness	
	picnic areas	all units	severe — prolonged wetness	

Soil units: RS6, RS7

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe	Erosion hazards	all units	slight to none
Equipment limitations	all units	moderate (severe)	Windthrow hazards	all units	moderate-severe
Species suitability	black spruce, balsam fir		Capability class	$\frac{5^{W}_{D}}{bs}$	

Note: Parentheses indicate seasonal variation.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
poor to fair	unsuitable	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	20–35 cm to a slowly permeable layer; prolonged wetness
Pond embankment	subsoil has medium to low shear strength, low to medium compressibility, low to medium compacted permeability, fair to good compaction characteristics, 15–25% coarse fragments of hard rock
Drainage	prolonged wetness; 20–35 cm of permeable material over a slowly permeable layer; stones may hinder tiling; outlets may be difficult to find
Sprinkler irrigation	prolonged wetness
Road location	prolonged wetness; potential frost damage

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–30	0.90–1.20	—	—	5–20	40–60	30–40	10–20	>5.0	0.20–0.25	4.0–5.0
30+	1.75–1.95	SM–SC	A–4	15–35	40–55	25–40	20–35	0.1–0.5	<0.10	4.5–5.5

St. Gabriel Association

Soil unit: SG2 **Area: 1362 ha**

Description of soil

These are predominantly moderately well drained, moderately deep, acid, fine-textured soils, low in natural fertility, which have formed in thin deposits of compact till derived mainly from gray green sandstone and red or possibly brown shale, over an easily split Pennsylvanian sandstone bedrock. The compact till is usually reddish brown, but occasionally is yellowish brown and it may or may not have a water-worked surface or a surficial mantle of yellowish brown loose till. Total thickness of the soil over bedrock is 50–100 cm. Of this, the surface 20–45 cm is a relatively loose, permeable sandy loam to loam or even clay loam material overlying a dense, compact, extremely slowly permeable loam to sandy clay loam or clay loam subsoil. A fragipan or stone line may be present. Coarse fragments of soft sandstone make up 5–25% usually increasing in abundance with depth. These soils usually occupy crests or upper slope positions in an undulating to almost level landscape.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	severe — depth to compact layer, extremely slow permeability	4D
Vegetable crops		all units	severe — depth to compact layer, extremely slow permeability	
Septic tanks		all units	severe — subsoil permeability, depth to bedrock	
Housing	with basement	all units	moderate — seasonal wetness; potential frost damage, depth to bedrock	
	without basement	all units	moderate — potential frost damage	
Sanitary landfill (area-type)		all units	severe — depth to bedrock	
Local roads and streets		a,b,c	moderate — seasonal wetness; subgrade suitability, potential frost damage	
		d	moderate — seasonal wetness; slope, subgrade suitability, potential frost damage	
Athletic fields		a,b	moderate — depth to bedrock, potential frost damage, surface coarse fragments	
		c	moderate — slope, depth to bedrock, potential frost damage	
		d	severe — slope	
Outdoor living	tent and trailer parks	a,b,c	slight to none — few or no adverse conditions except for a possible clay loam surface texture	
		d	moderate — slope	
	picnic areas	all units	slight to none — few or no adverse conditions except for a possibly clay loam surface texture	

Note: These soils are moderately deep phases (50–100 cm to bedrock) of the moderately well drained member of the Harcourt, Queen, Reece, and Stony Brook associations.

Soil unit: SG2

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	a,b,c d	slight to none (moderate) moderate	Erosion hazards	a,b,c d	slight to none moderate
Equipment limitations	a,b,c,d	slight to none	Windthrow hazards	all units	moderate
Species suitability	black spruce, balsam fir, white spruce, sugar maple,* white and yellow birch, beech		Capability class	$\frac{4^{D}}{bs}$	

*Species of limited suitability.
Note: Parentheses indicate seasonal variation.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair	unsuitable	unsuitable	fair

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	50–100 cm to extremely slowly permeable bedrock; 20–45 cm of permeable surface soil over extremely slowly permeable subsoil; d-slopes may affect storage capacity
Pond embankment	limited amount of subsoil-shallow to bedrock; subsoil has medium to low shear strength, low to medium compressibility, low compacted permeability, fair to good compaction characteristics, 10–25% coarse fragments of soft sandstone
Drainage	usually not needed but aids drying out in the spring; 50–100 cm to bedrock; 20–45 cm of permeable material over extremely slowly permeable subsoil
Sprinkler irrigation	good available water-holding capacity; good infiltration rate; 20–45 cm of permeable material over extremely slowly permeable subsoil
Road location	subsoil is potentially erodible; susceptibility to frost damage; cuts and fill necessary on d-slopes; 50–100 cm to soft, easily split sandstone bedrock

Some physical and chemical properties

Depth cm	Bulk density	Unified class	AASHO class	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–35	0.90–1.20	—	—	5–15	40–60	20–40	15–30	>5.0	0.20–0.25	4.0–5.0
35+	1.75–2.00	SM-SC	A-4	10–25	30–50	20–40	20–35	<0.1	<0.10	4.5–5.0

Soil units: SG3, SG4, SG5 **Area: 3728 ha**

Description of soil

These are predominantly imperfectly drained, moderately deep, acid, fine-textured soils, low in natural fertility, which have formed in thin deposits of compact till derived mainly from gray green sandstone and red or possibly brown shale, over easily split Pennsylvanian sandstone bedrock. The compact till is usually reddish brown, but occasionally is yellowish brown and it may or may not have a water-worked surface or a surficial mantle of yellowish brown loose till. Total thickness of the soil over bedrock is 50–100 cm. Of this, the surface 20–45 cm is a relatively loose, permeable sandy loam to loam or even clay loam material overlying a dense, compact, extremely slowly permeable loam to sandy clay loam or clay loam subsoil. A fragipan or stone line may be present. Coarse fragments of soft sandstone make up 5–25% usually increasing in abundance with depth. These soils usually occupy areas on the edges of depressions and middle to lower slope positions in an undulating to almost level landscape.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	severe — depth to compact layer; extremely slow permeability; seasonal wetness in combination with shallowness to bedrock	4DWR
Vegetable crops		all units	severe — depth to compact layer; extremely slow permeability; seasonal wetness in combination with shallowness to bedrock	
Septic tanks		all units	severe — subsoil permeability; seasonal wetness; depth to bedrock	
Housing	with basement	all units	severe — seasonal wetness	
	without basement	all units	moderate — seasonal wetness; potential frost damage	
Sanitary landfill (area-type)		all units	severe — depth to bedrock	
Local roads and streets		a,b,c	moderate — seasonal wetness; subgrade suitability; potential frost damage	
		d	moderate — seasonal wetness; slope, subgrade suitability; potential frost damage	
Athletic fields		a,b	moderate — seasonal wetness; depth to bedrock; potential frost damage	
		c	moderate — seasonal wetness; slope; depth to bedrock; potential frost damage	
		d	severe — slope	
Outdoor living	tent and trailer parks	a,b,c	moderate — seasonal wetness	
		d	moderate — seasonal wetness; slope	
	picnic areas	all units	moderate — seasonal wetness	

Note: These soils are moderately deep phases (50–100 cm to bedrock) of the imperfectly drained member of the Harcourt, Queens, Reece, and Stony Brook associations.

Soil units: SG3, SG4, SG5

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	moderate	Erosion hazards	a,b,c d	slight to none moderate
Equipment limitations	all units	moderate	Windthrow hazards	all units	moderate
Species suitability	black spruce, balsam fir, yellow birch, white spruce*		Capability class	SG3, SG4 – $\frac{4D}{bs}$	SG5 – $\frac{5W}{bD}$

*Species of limited suitability.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair	unsuitable	unsuitable	fair

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	50–100 cm to extremely slowly permeable bedrock; 20–45 cm of permeable material over an extremely slowly permeable subsoil; seasonal wetness; d-slopes may affect storage capacity
Pond embankment	limited amount of subsoil — shallowness to bedrock; subsoil has medium to low shear strength, low to medium compressibility, low compacted permeability, fair to good compaction characteristics; 10–25% coarse fragments of soft sandstone
Drainage	seasonal wetness; 20–45 cm of permeable material over an extremely slowly permeable subsoil; shallowness to bedrock may hinder tiling
Sprinkler irrigation	seasonal wetness; 20–45 cm of permeable material over an extremely slowly permeable subsoil; shallowness to bedrock
Road location	seasonal wetness; potentially erodible subsoil; cuts and fill necessary on d-slopes; potential frost damage; 50–100 cm to soft, easily split sandstone bedrock

Some physical and chemical properties

Depth cm	Bulk density	Unified class	AASHO class	% Coarse fragments (by vol.)	Soil (< 2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay < 0.002	Perm cm/hr	Available water cm/cm	pH (H_2O)
0–35	0.90–1.20	—	—	5–15	40–60	20–40	15–30	>5.0	0.20–0.25	4.0–5.0
35+	1.75–2.00	SM–SC	A–4	10–25	30–50	20–40	20–35	<0.1	<0.10	4.5–5.0

Soil units: SG6, SG7, SG8 **Area: 1039 ha**

Description of soil

These are predominantly poorly and very poorly drained, moderately deep, acid, fine-textured soils low in natural fertility, which have formed in thin deposits of compact till derived mainly from gray green sandstone and red or possibly brown shale, over an easily split Pennsylvanian sandstone bedrock. The compact till is usually reddish brown, but occasionally is yellowish brown and it may or may not have a water-worked surface or a surficial mantle of yellowish brown loose till. Total thickness of the soil over bedrock is 50–100 cm. Of this, the surface 20–45 cm is a relatively loose, permeable sandy loam to loam or even clay loam material overlying a dense, compact, extremely slowly permeable loam to sandy clay loam or clay loam subsoil. A fragipan or stone line may be present. Coarse fragments of soft sandstone make up 5–25% usually increasing in abundance with depth. These soils usually occupy depressions and lower slope positions in an undulating to almost level landscape.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	unsuitable — depth to compact layer; extremely slow permeability and excessive wetness in combination with shallowness to bedrock	5WR
Vegetable crops		all units	unsuitable — depth to compact layer; extremely slow permeability and excessive wetness in combination with shallowness to bedrock	
Septic tanks		all units	unsuitable — extremely slow permeability; prolonged wetness; depth to bedrock	
Housing	with basement	all units	severe (SG6, SG7) — prolonged wetness; potential frost damage unsuitable (SG8) — permanently wet	
	without basement	all units	severe (SG6, SG7) — prolonged wetness; potential frost damage unsuitable (SG8) — permanently wet	
Sanitary landfill (area-type)		all units	severe — prolonged wetness; depth to bedrock	
Local roads and streets		all units	severe — prolonged wetness; potential frost damage	
Athletic fields		all units	severe (SG6, SG7) — prolonged wetness; potential frost damage unsuitable (SG8) — permanently wet	
Outdoor living	tent and trailer parks	all units	severe (SG6, SG7)— prolonged wetness unsuitable (SG8) — permanently wet	
	picnic areas	all units	severe(SG6, SG7) — prolonged wetness unsuitable (SG8) — permanently wet	

Note: These soils are moderately deep phases (50–100 cm to bedrock) of the poorly and very poorly drained members of the Harcourt, Queens, Reece, and Stony Brook associations.

Soil units: SG6, SG7, SG8

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe	Erosion hazards	all units	slight to none
Equipment limitations	all units	moderate to severe	Windthrow hazards	all units	moderate-severe
Species suitability	black spruce, balsam fir		Capability class	SG6 - $\frac{5W}{bs}$	SG7, SG8 - $\frac{6W}{bs}$

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair	unsuitable	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	50–100 cm to extremely slowly permeable bedrock; 20–45 cm of permeable material over an extremely slowly permeable layer; prolonged wetness
Pond embankment	limited amount of subsoil — shallow to bedrock; subsoil has medium to low shear strength, low to medium compressibility, low compacted permeability, fair to good compaction characteristics, 10–25% coarse fragments of soft sandstone
Drainage	prolonged wetness; 50–100 cm to bedrock; 20–45 cm of permeable material over an extremely slowly permeable layer; shallowness to bedrock may hinder tiling; outlets difficult to find
Sprinkler irrigation	prolonged wetness
Road location	prolonged wetness; potentially erodible subsoil; potential frost damage; 50–100 cm to soft, easily split sandstone bedrock

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–30	0.90–1.20	—	—	5–15	40–60	20–40	15–30	>5.0	0.20–0.25	4.0–5.0
30+	1.75–2.00	SM–SC	A–4	10–25	30–50	20–40	20–35	<0.1	<0.10	4.5–5.0

Stony Brook Association

Soil unit: SB2 **Area: 1660 ha**

Description of soil

These are predominantly moderately well drained, deep, reddish brown, acid, fine-textured soils, low in natural fertility, which have formed in compact till deposits derived mainly from red shale and gray green sandstone. These soils usually have 30–45 cm of relatively loose, permeable, sandy loam to clay loam surface material over a dense compact, extremely slowly permeable loam to clay loam or sandy clay loam. Coarse fragments of soft sandstone make up 5–25%, usually increasing in abundance with depth. These soils usually occupy crests or upper slope positions in an undulating to almost level landscape.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	severe — shallow depth to compact layer; extremely slow permeability	4D
Vegetable crops		all units	severe — shallow depth to compact layer, extremely slow permeability, surface texture if clay loam	
Septic tanks		all units	severe — extremely slowly permeable subsoil	
Housing	with basement	all units	moderate — seasonal wetness; potential frost damage	
	without basement	all units	moderate — potential frost damage	
Sanitary landfill (area-type)		all units	moderate — seasonal wetness; subsoil texture if clay loam	
Local roads and streets		a,b,c	moderate — seasonal wetness; subgrade suitability; potential frost damage	
		d	moderate — seasonal wetness; slope; subgrade suitability; potential frost damage	
Athletic fields		a,b	moderate — potential frost damage; surface texture; surface coarse fragments	
		c	moderate — potential frost damage; slope; surface texture; surface coarse fragments	
		d	severe — slope	
Outdoor living	tent and trailer parks	a,b,c	slight to none — few or no adverse conditions but downgrade to moderate if clay loam surface texture	
		d	moderate — slope	
	picnic areas	all units	slight to none — few or no adverse conditions but downgrade to moderate if clay loam surface texture	

Soil unit: SB2

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	a,b,c d	slight to none (moderate) moderate	Erosion hazards	a,b,c d	slight to none moderate
Equipment limitations	a,b,c,d	slight to none	Windthrow hazards	all units	moderate
Species suitability	black spruce, balsam fir, white spruce, sugar maple, white and yellow birch, beech		Capability class	$\frac{4^{D}}{bs}$	

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair	unsuitable	unsuitable	fair

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	30–45 cm to extremely slowly permeable subsoil; d-slopes may affect storage capacity
Pond embankment	subsoil has medium to low shear strength; low to medium compressibility; low compacted permeability; fair to good compaction characteristics; 10–25% coarse fragments (soft sandstone)
Drainage	usually not needed but may speed up drying out in the spring; 30–45 cm to extremely slowly permeable subsoil
Sprinkler irrigation	good available water-holding capacity; good infiltration rate; 30–45 cm of permeable surface soil over extremely slowly permeable subsoil
Road location	subsoil is potentially erodible; susceptibility to frost damage; cuts and fills necessary on d-slopes

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	1.00–1.20	—	—	5–15	40–55	25–40	20–35	>5.0	0.20–0.25	4.0–5.0
40+	1.75–1.90	SM–SC	A–4	10–25	30–45	25–40	25–35	<0.1	<0.10	4.5–5.0

Soil units: SB3, SB4, SB5 **Area: 3484 ha**

Description of soil

These are predominantly imperfectly drained, deep, reddish brown, acid, fine-textured soils, low in natural fertility, which have formed in compact till deposits derived mainly from red shale and gray green sandstone. These soils usually have 30–45 cm of relatively loose, permeable, sandy loam to clay loam surface material over a dense compact, extremely slowly permeable loam to clay loam or sandy clay loam. Coarse fragments of soft sandstone make up 5–25%, usually increasing in abundance with depth. These soils usually occupy areas on the edges of depressions and middle to lower slope positions in an undulating to almost level landscape.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	severe — shallowness to compact layer; extremely slowly permeable subsoil; seasonal wetness	4DW
Vegetable crops		all units	severe — shallowness to compact layer; extremely slowly permeable subsoil; surface texture if clay loam; seasonal wetness	
Septic tanks		all units	severe — extremely slow permeability; seasonal wetness	
Housing	with basement	all units	severe — seasonal wetness	
	without basement	all units	moderate — seasonal wetness; potential frost damage	
Sanitary landfill (area-type)		all units	moderate — seasonal wetness; subsoil texture if clay loam	
Local roads and streets		a,b,c	moderate — seasonal wetness; subgrade suitability; potential frost damage	
		d	moderate — seasonal wetness; slope; subgrade suitability; potential frost damage	
Athletic fields		a,b	moderate — seasonal wetness; surface texture; potential frost damage; surface coarse fragments	
		c	moderate — seasonal wetness; slope; surface texture; potential frost damage; surface coarse fragments	
		d	severe — slope	
Outdoor living	tent and trailer parks	a,b,c	moderate — seasonal wetness; surface texture	
		d	moderate — seasonal wetness; slope; surface texture	
	picnic areas	all units	moderate — seasonal wetness; surface texture	

Soil units: SB3, SB4, SB5

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	moderate	Erosion hazards	a,b,c d	slight to none moderate
Equipment limitations	all units	moderate	Windthrow hazards	all units	moderate
Species suitability	black spruce, balsam fir, yellow birch, white spruce*		Capability class	SB3, SB4 – $\frac{4D}{bs}$	SB5 – $\frac{5W}{bs}$

*Species of limited suitability.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair	unsuitable	unsuitable	fair

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	30–45 cm to extremely slowly permeable subsoil; d-slopes may affect storage capacity; seasonal wetness
Pond embankment	subsoil has medium to low shear strength, low to medium compressibility, low compacted permeability, fair to good compaction characteristics, 10–25% coarse fragments (soft sandstone)
Drainage	seasonal wetness; 30–45 cm of permeable surface soil over extremely slowly permeable subsoil; stones may hinder tiling
Sprinkler irrigation	seasonal wetness; 30–45 cm to extremely slowly permeable subsoil
Road location	seasonal wetness; subsoil is potentially erodible; potential moderate frost damage; cuts and fill may be necessary on d-slopes

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	1.00–1.20	—	—	5–15	40–55	25–40	20–35	>5.0	0.20–0.25	4.0–5.0
40+	1.75–1.90	SM–SC	A–4	10–25	30–45	25–40	25–35	<0.1	<0.10	4.5–5.0

Soil units: SB6, SB7 Area: 14 390 ha

Description of soil

These are predominantly poorly drained, deep, reddish brown, acid, fine-textured soils, low in natural fertility, which have formed in compact till deposits derived mainly from red shale and gray green sandstone. These soils usually have 30–40 cm of relatively loose, permeable, sandy loam to clay loam surface material over a dense compact, extremely slowly permeable loam to clay loam or sandy clay loam. Coarse fragments of soft sandstone make up 5–25%, usually increasing in abundance with depth. These soils usually occupy depressions and lower slope positions in an undulating to almost level landscape.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	unsuitable — combined effect of shallowness to compact layer; extremely slowly permeable subsoil; excessive wetness	5WD
Vegetable crops		all units	unsuitable — combined effect of shallowness to compact layer; extremely slowly permeable subsoil; excessive wetness	
Septic tanks		all units	severe — prolonged wetness; extremely slow permeability	
Housing	with basement	all units	severe — prolonged wetness; potential frost damage	
	without basement	all units	severe — prolonged wetness; potential frost damage	
Sanitary landfill (area-type)		all units	moderate — prolonged wetness	
Local roads and streets		all units	severe — prolonged wetness; potential frost damage	
Athletic fields		all units	severe — prolonged wetness; potential frost damage	
Outdoor living	tent and trailer parks	all units	severe — prolonged wetness	
	picnic areas	all units	severe — prolonged wetness	

Soil units: SB6, SB7

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe	Erosion hazards	all units	slight to none
Equipment limitations	all units	moderate (severe)	Windthrow hazards	all units	moderate-severe
Species suitability	black spruce, balsam fir		Capability class	SB6 – $\frac{5W}{bs}$	SB7 – $\frac{6W}{bs}$

Note: Parentheses indicate seasonal variation.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair	unsuitable	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	30–40 cm to extremely slowly permeable subsoil; prolonged wetness
Pond embankment	subsoil has medium to low shear strength, low to medium compressibility, low compacted permeability, fair to good compaction characteristics, 10–25% coarse fragments (soft sandstone)
Drainage	prolonged wetness; 30–40 cm to extremely slowly permeable subsoil; stones may hinder tiling; outlets difficult to find
Sprinkler irrigation	prolonged wetness
Road location	prolonged wetness; potentially erodible subsoil; potential severe frost damage

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–35	1.00–1.20	—	—	5–15	40–55	25–40	20–35	>5.0	0.20–0.25	4.0–5.0
35+	1.75–1.90	SM–SC	A–4	10–25	30–45	25–40	25–35	<0.1	<0.10	4.5–5.0

Soil unit: SB8 Area: 608 ha

Description of soil

These are predominantly very poorly drained, deep, reddish brown, acid, fine-textured soils, low in natural fertility, which have formed in compact till deposits derived mainly from red shale and gray green sandstone. These soils usually have 30–40 cm of relatively loose, permeable, sandy loam to clay loam surface material over a dense compact, extremely slowly permeable loam to clay loam or sandy clay loam. Coarse fragments of soft sandstone make up 5–25%, usually increasing in abundance with depth. These soils usually occupy depressions and lower slope positions in a slightly undulating to almost level landscape.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	unsuitable — permanently wet	7W
Vegetable crops		all units	unsuitable — permanently wet	
Septic tanks		all units	unsuitable — permanently wet	
Housing	with basement	all units	unsuitable — permanently wet	
	without basement	all units	unsuitable — permanently wet	
Sanitary landfill (area-type)		all units	severe — permanently wet	
Local roads and streets		all units	severe — permanently wet; potential frost damage	
Athletic fields		all units	unsuitable — permanently wet	
Outdoor living	tent and trailer parks	all units	unsuitable — permanently wet	
	picnic areas	all units	unsuitable — permanently wet	

Soil unit: SB8

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe	Erosion hazards	all units	slight to none
Equipment limitations	all units	severe	Windthrow hazards	all units	severe
Species suitability	black spruce,* balsam fir*		Capability class	6W bs	

*Species of limited suitability

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
poor	unsuitable	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	30–40 cm to extremely slowly permeable subsoil; permanently wet
Pond embankment	subsoil has medium to low shear strength, low to medium compressibility, low compacted permeability, fair to good compaction characteristics, 10–25% coarse fragments (soft sandstone)
Drainage	permanently wet; 30–40 cm to extremely slowly permeable subsoil; stones may hinder tiling; outlets difficult to find
Sprinkler irrigation	permanently wet
Road location	permanently wet; potentially erodible subsoil; potential severe frost damage

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–35	1.00–1.20	—	—	5–15	40–55	25–40	20–35	>5.0	0.20–0.25	4.0–5.0
35+	1.75–1.90	SM–SC	A–4	10–25	30–45	25–40	25–35	<0.1	<0.10	4.5–5.0

Sunbury Association

Soil units: S1, S2 **Area:** 15 103 ha

Description of soil

These are predominantly well to rapidly drained, deep, yellowish brown, acid, coarse-textured soils, low in natural fertility, which have formed in deposits of loose till derived mainly from gray green sandstone. The entire depth of the soil (greater than 100 cm) consists of a relatively loose, permeable to rapidly permeable material, which grades from a sandy loam surface texture into a loamy sand to sandy loam subsoil. Coarse fragments of flat, platelike, soft sandstone make up 10–30 or even 40%, usually increasing in abundance with depth. Surface stones are common. These soils usually occupy crests and upper slope positions in an undulating to gently rolling landscape. They are also commonly found along stream and river courses.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c,d	severe — combined effect of fertility, droughtiness and subsurface stoniness problems	4PM 5PT
		e,f	unsuitable — slope	7T
Vegetable crops		a,b,c,d	severe — combined effect of fertility, droughtiness, and surface coarse fragment problems	
		e,f	unsuitable — slope	
Septic tanks		a,b,c,d	slight to none — few or no adverse conditions (downgrade to moderate if stoniness 3)	
		e	moderate — slope	
		f	severe — slope	
Housing	with basement	a,b,c,d	slight to none — few or no adverse conditions with the possible exception of potential frost damage	
		e	moderate — slope	
		f	severe — slope	
	without basement	a,b,c,d	slight to none — few or no adverse conditions with the possible exception of potential frost damage	
		e	moderate — slope	
		f	severe — slope	
Sanitary landfill (area-type)		all units	severe — possibility of groundwater contamination due to permeability of subsoil (possibly slope)	
Local roads and streets		a,b,c	slight to none — few or no adverse conditions with the possible exception of potential frost damage	
		d,e	moderate — slope	
		f	severe or unsuitable — slope	
Athletic fields		a,b	moderate — moisture deficiency; surface coarse fragments	
		c	moderate — slope, moisture deficiency; surface coarse fragments	
		d	severe — slope	
		e,f	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c	moderate — moisture deficiency	
		d	moderate — slope; moisture deficiency	
		e	severe — slope	
		f	unsuitable — slope	
	picnic areas	a,b,c,d	unsuitable — moisture deficiency	
		e	unsuitable — slope; moisture deficiency	
		f	severe — slope	

Soil units: S1, S2

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	a,b,c d,e f	slight to none moderate severe	Erosion hazards	a,b,c,d e,f	slight to none moderate
Equipment limitations	a,b,c,d e,f	slight to none moderate	Windthrow hazards	all units	slight to none
Species suitability	jack pine, red pine, eastern white pine, sugar maple,* beech, white birch, black spruce		Capability class	4^{t}_{w} $_{sp}$	

*Species of limited suitability

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair to poor (max. 15% slope)	unsuitable	poor	good

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	permeable subsoil, greater than 100 cm to either a water table or bedrock
Pond embankment	subsoil has high to medium shear strength, low compressibility, high to medium compacted permeability, good to fair compaction characteristics, 20–35% coarse fragments of soft sandstone
Drainage	not needed; permeable soil
Sprinkler irrigation	fair water-holding capacity, very good infiltration rate, permeable subsoil, may be stony
Road location	may be stony; cuts and fill necessary on d-slopes and steeper

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	1.00–1.15	—	—	10–20	60–80	10–30	7–14	>20.0	0.10–0.15	4.0–5.0
40+	1.45–1.70	GW–GM or SW–SM	A–1 or A–2	20–35	70–85	10–25	6–12	5.0–10.0	0.10–0.15	4.5–5.0

Soil units: S3, S4, S5 **Area: 7864 ha**

Description of soil

These are predominantly imperfectly drained, deep, yellowish brown, acid, coarse-textured soils low in natural fertility, which have formed in deposits of loose till derived mainly from gray green sandstone. The entire depth of the soil (greater than 100 cm) consists of a relatively loose, permeable to rapidly permeable material, which grades from a sandy loam surface texture into a loamy sand to sandy loam subsoil. Coarse fragments of flat, platelike soft sandstone make up 10–30 or even 40%, usually increasing in abundance with depth. Surface stones are common. These soils usually occupy areas on the edges of depressions and middle to lower slope positions in an undulating to gently rolling landscape. They are also commonly found along stream and river courses.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c,d	severe — combined effect of fertility, subsurface stoniness, and seasonal wetness problems	4PW 5PT
		e	unsuitable — slope	
Vegetable crops		a,b,c,d	severe — combined effect of fertility, surface coarse fragments and seasonal wetness problems	
		e	unsuitable — slope	
Septic tanks		all units	severe — seasonal wetness	
Housing	with basement	a,b,c,d	severe — seasonal wetness	
		e	severe — seasonal wetness; slope	
	without basement	a,b,c,d	moderate — seasonal wetness	
		e	moderate — seasonal wetness; slope	
Sanitary landfill (area-type)		all units	severe — seasonal wetness and subsoil permeability or both might result in groundwater contamination	
Local roads and streets		a,b,c	moderate — seasonal wetness	
		d,e	moderate — seasonal wetness; slope	
Athletic fields		a,b	moderate — seasonal wetness; surface coarse fragments	
		c	moderate — seasonal wetness; slope; surface coarse fragments	
		d	severe — slope	
		e	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c	moderate — seasonal wetness	
		d	moderate — seasonal wetness; slope	
		e	severe — slope	
	picnic areas	a,b,c,d	moderate — seasonal wetness	
		e	moderate — seasonal wetness; slope	

Soil units: S3, S4, S5

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	a,b,c d,e	slight to none moderate	Erosion hazards	a,b,c,d e	slight to none moderate
Equipment limitations	a,b,c,d e	slight to none moderate	Windthrow hazards	all units	slight to none
Species suitability	jack pine, red pine, eastern white pine, black spruce, balsam fir, yellow birch		Capability class	S3 – $\frac{4F}{tp}$	S4, S5 $\frac{4}{bs}$

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair to poor (max. 15% slope)	unsuitable	poor	fair

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	permeable subsoil; seasonal wetness
Pond embankment	subsoil has high to medium shear strength, low compressibility, high to medium compacted permeability, good to fair compaction characteristics, 20–35% coarse fragments of soft sandstone
Drainage	seasonal wetness; greater than 100 cm of permeable material; stones may hinder tile laying
Sprinkler irrigation	seasonal wetness (usually not needed) but good infiltration rate; fair water-holding capacity, permeable subsoil; may be stony
Road location	may be stony; cuts and fill necessary on d-slopes and steeper; seasonal wetness

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	1.00–1.15	—	—	10–20	60–80	10–30	7–14	>20.0	0.10–0.15	4.0–5.0
40+	1.45–1.70	GW–SM or SW–SM	A–1 or A–2	20–35	70–85	10–25	6–12	5.0–10.0	0.10–0.15	4.5–5.0

Soil units: S6, S7 **Area: 1496 ha**

Description of soil

These are predominantly poorly drained, deep, yellowish brown, acid, coarse-textured soils low in natural fertility, which have formed in deposits of loose till derived mainly from gray green sandstone. The entire depth of the soil (greater than 100 cm) consists of a relatively loose, permeable to rapidly permeable material, which grades from a sandy loam surface texture into a loamy sand to sandy loam subsoil. Coarse fragments of flat, platelike soft sandstone make up 10–30 or even 40%, usually increasing in abundance with depth. Surface stones are common. These soils usually occupy depressions or lower slope positions in an undulating to gently rolling landscape.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	unsuitable — combined effect of excessive wetness and fertility problems	5^W
Vegetable crops		all units	unsuitable — combined effect of excessive wetness and fertility problems and possibly surface coarse fragments	
Septic tanks		all units	severe — prolonged wetness	
Housing	with basement	all units	severe — prolonged wetness	
	without basement	all units	severe — prolonged wetness	
Sanitary landfill (area-type)		all units	unsuitable — prolonged wetness combined with subsoil permeability result in potential pollution problem	
Local roads and streets		all units	severe — prolonged wetness; possibly slope	
Athletic fields		a,b,c d	severe — prolonged wetness severe — prolonged wetness; slope	
Outdoor living	tent and trailer parks	all units	severe — prolonged wetness	
	picnic areas	all units	severe — prolonged wetness	

Soil units: S6, S7

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	moderate	Erosion hazards	all units	slight to none
Equipment limitations	all units	moderate	Windthrow hazards	all units	moderate
Species suitability	black spruce, balsam fir		Capability class	5W bs	

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
poor to fair (max. 15% slope)	unsuitable	poor	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	prolonged wetness; permeable subsoil
Pond embankment	subsoil has high to medium shear strength, low compressibility, high to medium compacted permeability, good to fair compaction characteristics, 20–35% coarse fragments of soft sandstone
Drainage	prolonged wetness; permeable throughout; stones may hinder tile laying, drainage outlets difficult to find
Sprinkler irrigation	prolonged wetness
Road location	prolonged wetness; possibly stony

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–40	1.00–1.15	—	—	10–20	60–80	10–30	7–14	>20.0	0.10–0.15	4.0–5.0
40+	1.45–1.70	GW–GM or SW–SM	A–1 or A–2	20–35	70–85	10–25	6–12	5.0–10.0	0.10–0.15	4.5–5.0

Tracadie Association

Soil units: TD3, TD4, TD5 **Area: 184 ha**

Description of soil

These are predominantly imperfectly drained, deep, dusky red, clayey-textured soils, moderate in natural fertility, which have formed in compact marine deposits derived mainly from red shale and lesser amounts of red sandstone. The soil pH usually increases with depth from an acid surface to neutral at the 1–m level and becomes strongly calcareous at 100–150 cm below the surface. There are about 25–40 cm of relatively loose, permeable loam to silty clay loam surface material over a dense, compact, extremely slowly permeable silty clay loam to silty clay subsoil. Except for the occasional rounded soft sandstone gravel fragments (less than 1%) there are no coarse fragments. These soils occupy middle to lower slope positions and are most commonly found along or close to tidal rivers, which are associated with varying degrees of slope from almost level to moderately rolling.

Farmland, community development, and recreation uses

Use	Slope	Degree and kind of limitation	CLI capability
Field crops	a.b.c.d	severe — shallowness to compact layer; extremely slowly permeable; seasonal wetness	4DW
	e	severe — shallowness to compact layer; extremely slowly permeable; seasonal wetness; slope	4DT
Vegetable crops	all units	unsuitable — shallowness to compact layer; extremely slowly permeable subsoil; seasonal wetness	
Septic tanks	all units	severe — extremely slowly permeable; seasonal wetness	
Housing with basement	all units	severe — seasonal wetness	
Housing without basement	a.b.c.d	moderate — seasonal wetness; potential frost and shrink-swell damage	
	e	moderate — seasonal wetness; potential frost and shrink-swell damage; slope	
Sanitary landfill (area-type)	all units	moderate — seasonal wetness; subsoil texture (downgrade to severe if silty clay)	
Local roads and streets	a.b.c	moderate to severe — seasonal wetness; subgrade suitability; potential frost and shrink-swell damage	
	d.e	moderate to severe — seasonal wetness; subgrade suitability; potential frost and shrink-swell damage; slope	
Athletic fields	a.b	moderate — seasonal wetness; surface texture; potential frost action	
	c	moderate — seasonal wetness; surface texture; potential frost action; slope	
	d	severe — slope	
	e	unsuitable — slope	
Outdoor living tent and trailer parks	a.b.c	moderate — surface texture; seasonal wetness	
	d	moderate — seasonal wetness; surface texture; slope	
	e	severe — slope	
Outdoor living picnic areas	a.b.c.d	moderate — seasonal wetness; surface texture	
	e	moderate — seasonal wetness; surface texture; slope	

Soil units: TD3, TD4, TD5

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe-moderate	Erosion hazards	a,b,c d e	slight to none moderate severe
Equipment limitations	all units	moderate (severe)	Windthrow hazards	all units	moderate
Species suitability	black spruce, balsam fir, white spruce*		Capability class	TD3, TD4 - $\frac{4D}{bs}$ TD5 - $\frac{5W}{bs}$	

*Species of limited suitability.
Note: Parentheses indicate seasonal variation.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair	unsuitable	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	20–40 cm to an extremely slowly permeable subsoil; seasonal wetness; d-slope and steeper may affect storage capacity
Pond embankment	subsoil has medium to low shear strength, medium compressibility, low compacted permeability, fair compaction characteristics, clayey material is difficult to work
Drainage	seasonal wetness; 20–40 cm of permeable surface soil over an extremely slowly permeable subsoil
Sprinkler irrigation	seasonal wetness
Road location	seasonal wetness; potentially erodible; susceptible to shrink-swell and frost action; clayey material is difficult to work; cuts and fill necessary on d-slopes and steeper

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–30	1.00–1.30	—	—	<1%	10–40	40–70	15–30	>5.0	0.20–0.25	4.5–5.5
30+	1.70–2.00	CL-ML	A–4 (A–6)	<1%	3–10	40–60	35–50	<0.1	<0.10	5.5–7.0

Soil units: TD6, TD7 Area: 1007 ha

Description of soil

These are predominantly poorly drained, deep, dusky red, clayey-textured soils, moderate in natural fertility, which have formed in compact marine deposits derived mainly from red shale and lesser amounts of red sandstone. The soil pH usually increases with depth from an acid surface to neutral at the 1-m level. There are about 20–35 cm of relatively loose, permeable loam to silty clay loam surface material over a dense compact extremely slowly permeable silty clay loam to silty clay subsoil. Except for the occasional rounded soft sandstone gravel fragments (less than 1%), there are no coarse fragments. These soils occupy depressions and lower slope positions in an undulating to almost level landscape and are most commonly found along or close to tidal rivers.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	unsuitable — combined effect of prolonged wetness; shallowness to compact layer; and extremely slow permeability	5WD
Vegetable crops		all units	unsuitable — combined effect of prolonged wetness; shallowness to compact layer; and extremely slow permeability	
Septic tanks		all units	severe — prolonged wetness; extremely slowly permeable subsoil	
Housing	with basement	all units	severe — prolonged wetness; potential frost and shrink-swell damage	
	without basement	all units	severe — prolonged wetness; potential frost and shrink-swell damage	
Sanitary landfill (area-type)		all units	moderate — prolonged wetness; subsoil texture (downgrade to severe if silty clay)	
Local roads and streets		all units	severe — prolonged wetness (subgrade suitability)	
Athletic fields		all units	severe — prolonged wetness	
Outdoor living	tent and trailer parks	all units	severe — prolonged wetness	
	picnic areas	all units	severe — prolonged wetness	

Soil units: TD6, TD7

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe	Erosion hazards	a,b,c d	slight to none moderate
Equipment limitations	all units	severe	Windthrow hazards	all units	severe to moderate
Species suitability	black spruce, balsam fir		Capability class	TD6 - 5W bs	TD7 - 6W bs

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair to poor	unsuitable	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	prolonged wetness; 20–40 cm to an extremely slowly permeable layer
Pond embankment	subsoil has medium to low shear strength, medium compressibility, low compacted permeability, fair compaction characteristics, clayey material is difficult to work
Drainage	prolonged wetness; 20–40 cm of permeable material over an extremely slowly permeable subsoil; outlets may be difficult to find
Sprinkler irrigation	prolonged wetness
Road location	prolonged wetness; potentially erodible; potential frost and shrink–swell damage; clayey material is difficult to work

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm cm/hr	Available water cm/cm	pH (H_2O)
0–30	1.00–1.30	—	—	<1%	10–40	40–70	15–30	>5.0	0.20–0.25	4.5–5.5
30+	1.70–2.00	CL–ML	A–4 (A–6)	<1%	3–10	40–60	35–50	<0.1	<0.10	5.5–7.0

Upper Caraquet Association

Soil unit: UC2 **Area: 520 ha**

Description of soil

These are predominantly well to moderately well drained, deep, acid soils, low to moderate in natural fertility, which have formed in a moderately thin surficial mantle of glacial marine-deposited sandy material derived mainly from gray green sandstone over a clayey-textured marine-deposited material derived mainly from brown shale. The upper material is olive brown, loose, rapidly permeable, loamy sand to sandy loam material 20–50 cm thick and is free of coarse fragments (less than 2% gravel). The second or lower material is yellowish brown, compact, extremely slowly permeable silty clay loam and is also free of coarse fragments, except for some sandstone gravel fragments. These soils usually occupy crests and upper slope positions in an undulating to almost level landscape and typically are found near the coast.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c,d	severe — depth to compact subsoil; subsoil extremely slowly permeable	4D
		e	severe — depth to compact subsoil; subsoil extremely slowly permeable; slope	4DT
Vegetable crops		a,b,c	severe — depth to compact subsoil; subsoil extremely slowly permeable	
		d, part	severe — depth to compact subsoil; subsoil extremely slowly permeable; slope	
Septic tanks		all units	severe — extremely slowly permeable subsoil	
Housing	with basement	a,b,c,d	moderate — potential frost damage; shrink-swell potential damage; seasonal wetness	
		e	moderate — potential frost damage; shrink-swell potential damage; seasonal wetness; slope	
	without basement	a,b,c,d	moderate — potential frost damage; shrink-swell potential damage	
		e	moderate — potential frost damage; shrink-swell potential damage; slope	
Sanitary landfill (area-type)		a,b,c,d	moderate — seasonal wetness; subsoil texture	
		e	moderate — seasonal wetness; subsoil texture, slope	
Local roads and streets		a,b,c	moderate — subgrade suitability; potential shrink-swell damage; potential frost damage	
		d,e	moderate — subgrade suitability; potential shrink-swell damage; potential frost damage; slope	
Athletic fields		a,b	moderate — potential frost damage; surface texture if loamy sand	
		c	moderate — potential frost damage; surface texture if loamy sand; slope	
		d	severe — slope	
		e	unsuitable — slope	
Outdoor living	tent and trailer parks	a,b,c	slight to none — few or no adverse conditions (downgrade if loamy sand surface texture)	
		d	moderate — slope, surface texture if loamy sand	
		e	severe — slope	
	picnic areas	a,b,c,d	slight to none — few or no adverse conditions (downgrade if loamy sand surface texture)	
		e	moderate — slope	

Note: These are shallow phases (20–50 cm to marine clay) of the drained member of the Richibucto association.

Soil unit: UC2

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	a,b,c,d,e	moderate	Erosion hazards	a,b,c d	slight to none moderate severe
Equipment limitations	a,b,c,d e	slight to none moderate	Windthrow hazards	all units	moderate
Species suitability	black spruce, balsam fir, white spruce, white birch, sugar maple,* beech		Capability class	4D bs	

*Species of limited suitability.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair (poor if loamy sand)	poor	unsuitable	fair to poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	extremely slowly permeable subsoil 20–50 cm from the surface; d-slopes and steeper may affect storage capacity
Pond embankment	subsoil has medium to low shear strength, medium compressibility; low compacted permeability, and fair to good compaction characteristics; moderate shrink-swell potential
Drainage	usually not needed but speeds up drying out in the spring; 20–50 cm of rapidly permeable material over an extremely slowly permeable subsoil
Sprinkler irrigation	20–50 cm to a relatively impermeable layer; very good infiltration rate but only fair water-holding capacity in the surface soil
Road location	subsoil is potentially erodible and susceptible to frost action; trafficability could be a problem

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–35	1.20–1.40	—	—	<2	70–95	5–15	2–10	>25.0	0.10–0.15	4.0–5.0
35+	1.70–1.90	ML–CL	A–4 or A–7	<2	2–10	45–65	30–45	<0.1	<0.10	5.0–5.5

Soil units: UC3, UC4, UC5 **Area: 537 ha**

Description of soil

These are predominantly imperfectly drained, deep, acid soils, low to moderate in natural fertility, which have formed in a moderately thin surficial mantle of glacial marine-deposited sandy material derived mainly from gray green sandstone over a clayey-textured marine-deposited material derived mainly from brown shale. The upper material is olive brown, loose, rapidly permeable, loamy sand to sandy loam material, 20–50 cm thick that is free of coarse fragments (less than 2% gravel). The second or lower material is yellowish brown, compact, slowly permeable silty clay to silty clay loam and is also free of coarse fragments, except for some sandstone gravel fragments. These soils usually occupy areas on the edge of depressions and middle to lower slope positions in an undulating to almost level landscape and are typically found near the coast.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		a,b,c,d	severe — depth to compact subsoil; extremely slowly permeable; seasonal wetness	4DW
Vegetable crops		all units	severe — depth to compact subsoil; extremely slowly permeable seasonal wetness; slope if 5–12%	
Septic tanks		all units	severe — extremely slowly permeable subsoil; seasonal wetness	
Housing	with basement	all units	severe — seasonal wetness	
	without basement	a,b,c,d	moderate — seasonal wetness; potential frost damage; shrink–swell potential damage	
Sanitary landfill (area-type)		all units	moderate — seasonal wetness; subsoil texture	
Local roads and streets		a,b,c	moderate — seasonal wetness; subgrade suitability; shrink–swell potential damage; potential frost action	
		d	moderate — seasonal wetness; subgrade suitability; shrink–swell potential damage; potential frost action; slope	
Athletic fields		a,b	moderate — seasonal wetness; potential frost action; surface texture if loamy sand	
		c	moderate — seasonal wetness; potential frost action; surface texture if loamy sand; slope	
		d	severe — slope	
Outdoor living	tent and trailer parks	a,b,c	moderate — seasonal wetness; surface texture if loamy sand	
		d	moderate — seasonal wetness; surface texture if loamy sand; slope	
	picnic areas	a,b,c,d	moderate — seasonal wetness; surface texture if loamy sand	

Note: These are shallow phases (20–50 cm to marine clay) of the imperfectly drained member of the Richibucto association.

Soil units: UC3, UC4, UC5

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe-moderate	Erosion hazards	a,b,c d	slight to none moderate
Equipment limitations	all units	moderate (severe)	Windthrow hazards	all units	moderate
Species suitability	black spruce, balsam fir, yellow birch, white spruce*		Capability class	UC3, UC4 – 4^{D}_{W}	UC5 – 5^{W}_{bs}

*Species of limited suitability.
Note: Parentheses indicate seasonal variation.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair (poor if loamy sand)	poor	unsuitable	fair to poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	20–50 cm to an extremely slowly permeable subsoil; seasonal wetness; d-slopes and steeper may reduce storage capacity.
Pond embankment	subsoil has medium to low shear strength, medium compressiblity, low compacted permeability, fair to good compaction characteristics, and a moderate shrink-swell potential
Drainage	seasonal wetness; 20–50 cm of permeable material over an extremely slowly permeable subsoil
Sprinkler irrigation	seasonal wetness; needs drainage first
Road location	subsoil is potentially erodible; susceptible to frost action and has a moderate shrink-swell potential; seasonal wetness; possible trafficability problem

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–35	1.20–1.40	—	—	<2	70–95	5–15	2–10	>25.0	0.10–0.15	4.0–5.0
35	1.70–1.90	ML–CL	A–4	<2	2–10	45–65	30–45	<0.1	<0.10	5.0–5.5

Soil units: UC6, UC7 **Area: 1777 ha**

Description of soil

These are predominantly poorly drained, deep, acid soils, low to moderate in natural fertility, which have formed in a moderately thin surficial mantle of glacial marine-deposited sandy material derived mainly from gray green sandstone over a clayey-textured marine-deposited material derived mainly from brown shale. The upper material is olive brown, loose, rapidly permeable, loamy sand to sandy loam material, 20–50 cm thick that is free of coarse fragments (less than 2% gravel). The second or lower material is yellowish brown, compact, extremely slowly permeable silty clay to silty clay loam and is also free of coarse fragments, except for some sandstone gravel fragments. These soils usually occupy depressions and lower slope positions in an almost level to slightly undulating landscape and are typically found near the coast.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	unsuitable — depth to compact layer; extremely slowly permeable; excessive wetness	5WD
Vegetable crops		all units	unsuitable — depth to compact layer; extremely slowly permeable; excessive wetness	
Septic tanks		all units	severe — extremely slowly permeable; prolonged wetness	
Housing	with basement	all units	severe — prolonged wetness	
	without basement	all units	severe — prolonged wetness	
Sanitary landfill (area-type)		all units	moderate — prolonged wetness; subsoil texture	
Local roads and streets		all units	severe — prolonged wetness; subgrade instability	
Athletic fields		a,b,c d e	severe — prolonged wetness severe — prolonged wetness; slope unsuitable — slope	
Outdoor living	tent and trailer parks	all units	severe — prolonged wetness	
	picnic areas	all units	severe — prolonged wetness	

Note: These are shallow phases (20–50 cm to marine clay) of the poorly drained member of the Richibucto association.

Soil units: UC6, UC7

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe	Erosion hazards	a,b,c	slight to none
Equipment limitations	all units	severe	Windthrow hazards	all units	moderate-severe
Species suitability	black spruce, balsam fir		Capability class	UC6 – $\frac{5W}{bs}$	UC7 – $\frac{6W}{bs}$

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
fair (poor if loamy sand)	poor	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	20–50 cm to an extremely slowly permeable subsoil; prolonged wetness
Pond embankment	subsoil has medium to low shear strength, medium compressibility, low compacted permeability, fair to good compaction characteristics, and a moderate shrink–swell potential
Drainage	prolonged wetness; top 20–50 cm are readily permeable but the material below is extremely slowly permeable; outlets may be difficult to find
Sprinkler irrigation	prolonged wetness; needs drainage first
Road location	prolonged wetness; subsoil is potentially erodible, susceptible to frost action, and has a moderate shrink–swell potential; expected trafficability problem

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–35	1.20–1.40	—	—	<2	70–95	5–15	2–10	>25.0	0.10–0.15	4.0–5.0
35	1.70–1.90	ML–CL	A–4 or A–7	<2	2–10	45–65	30–45	<0.1	<0.10	5.0–5.5

Soil unit: UC8 **Area: 807 ha**

Description of soil

These are predominantly very poorly drained, deep, acid soils, low to moderate in natural fertility, which have formed in a moderately thin surficial mantle of glacial marine-deposited sandy material derived mainly from gray green sandstone over a clayey-textured marine-deposited material derived mainly from brown shale. The upper material is olive brown, loose, rapidly permeable, loamy sand to sandy loam material, 20–50 cm thick that is free of coarse fragments (less than 2% gravel). The second or lower material is yellowish brown, compact, extremely slowly permeable silty clay to silty clay loam and is also free of coarse fragments, except for some sandstone gravel fragments. These soils usually occupy depressions in a level to almost level landscape and are typically found near the coast.

Farmland, community development, and recreation uses

Use		Slope	Degree and kind of limitation	CLI capability
Field crops		all units	unsuitable — permanently wet	7W
Vegetable crops		all units	unsuitable — permanently wet	
Septic tanks		all units	unsuitable — permanently wet	
Housing	with basement	all units	unsuitable — permanently wet	
	without basement	all units	unsuitable — permanently wet	
Sanitary landfill (area-type)		all units	severe — permanently wet; subsoil texture if silty clay	
Local roads and streets		all units	severe — permanently wet; subgrade instability	
Athletic fields		all units	unsuitable — permanently wet	
Outdoor living	tent and trailer parks	all units	unsuitable — permanently wet	
	picnic areas	all units	unsuitable — permanently wet	

Note: These are shallow phases (20–50 cm to marine clay) of the very poorly drained member of the Richibucto association.

Soil unit: UC8

Degree of limitations affecting woodland uses

Interpretation	Landform	Degree of limitation	Interpretation	Landform	Degree of limitation
Access road construction	all units	severe	Erosion hazards	all units	slight to none
Equipment limitations	all units	severe	Windthrow hazards	all units	severe
Species suitability	black spruce,* balsam fir*		Capability class	6W bs	

*Species of limited suitability.

Suitability of soil as source of material

Topsoil	Sand	Gravel	Road fill
unsuitable	poor	unsuitable	poor

Soil features affecting specified engineering uses

Use	Soil features
Pond reservoir area	20–50 cm to an extremely slowly permeable subsoil
Pond embankment	subsoil has medium to low shear strength, medium compressibility, low compacted permeability, fair to good compaction characteristics, and a moderate shrink-swell potential
Drainage	permanently wet; top 20–50 cm readily permeable but the material below is extremely slowly permeable; outlets may be difficult to find
Sprinkler irrigation	permanently wet; needs irrigation first
Road location	permanently wet; subsoil is potentially erodible; susceptible to frost action and has a moderate shrink-swell potential; expected trafficability problem

Some physical and chemical properties

Depth cm	Bulk density	Unified class.	AASHO class.	% Coarse fragments (by vol.)	Soil (<2 mm) % Sand >0.05	% Silt 0.05–0.002	% Clay <0.002	Perm. cm/hr	Available water cm/cm	pH (H_2O)
0–35	1.20–1.40	—	—	<2	70–95	5–15	2–10	>25.0	0.10–0.15	4.0–5.0
35	1.70–1.90	ML–CL	A–4 or A–7	<2	2–10	45–65	30–45	<0.1	<0.10	5.0–5.5

CHAPTER FIVE: ENGINEERING DATA, SOIL DESCRIPTIONS, AND ANALYTICAL DATA

Engineering test data for soil parent materials (Table 18)

The soil samples collected for engineering tests are usually about 1 m deep from the surface of mineral soil. Consequently, soils with less than 1 m of unconsolidated mineral material over bedrock were not tested (i.e., soil units of Baie-du-Vin, Big Hole, Fair Isle, Galloway, and St. Gabriel).

The following soil associations in the left column do not appear in Table 18, because the soil material at 1 m is either the same as or similar to the soil associations in the list on the right.

Barrieau	Harcourt
Buctouche	Harcourt
Caraquet	Mount Hope
Kouchibouguac	Richibucto
Stony Brook	Harcourt
Tracadie	Fundy
Upper Caraquet	Mount Hope

Organic soils, land types, and some minor soil associations (i.e., Interval and Lord and Foy) were not tested.

The soils listed in Table 18 were analyzed by the Central Laboratory, Design Branch, Department of Transportation, New Brunswick, using ASTM.*

Test procedures were as follows:

Unified classification	D2487-69
AASHO classification	D3282-73
Liquid limit	D423-72
Plastic limit	D424-72
Plastic index	D424-72
Grain size analysis	D422-72
Sieve analysis—stone	C136-71
% pass #200 sieve	D1140-71
California baring ratio (CBR)	C1883-73
Specific gravity and absorption	
—coarse aggregate	C127-73
—fine aggregate	D854-72
Maximum dry density and percent optimum moisture	D698-70

Soil descriptions and analytical data

Descriptions of the major soil units of each map unit (with the exception of Interval soil, owing to limited area) are documented in alphabetical order. Many of the descriptions are followed by a table of analytical data. There are no descriptions for organic soils and land types.

The soil description format and terminology used was according to the *Manual for describing soils in the field*. Dumanski, J., ed. Ottawa, Ont. K1A 0C6. Land Resource Research Institute; 1978.

Methods used for soil sampling and analysis are outlined in a manual prepared by a subcommittee of the Canada Soil Survey Committee, *Manual on soil sampling and methods of analysis*. McKeague, J. A., ed. Canadian Society of Soil Science; 1978. Numbers of these methods are indicated in parentheses: mechanical analysis by hydrometer method (2.12); pretreatments to remove organic matter, iron oxides, and carbonates (2.111), if necessary; bulk density by core method (2.21); for soils with fragipan or ortstein, the paraffin clod method was used (2.23); moisture content and retention (2.4); percentage of pore space was calculated from the moisture retention data by assuming that the soil particle density equaled 2.65 g/cm^3; hydraulic conductivity (saturated) (2.51) or (2.52); pH water (3.13); $CaCl_2$ (3.11); organic carbon by wet oxidation (3.612); exchangeable cations by NaCl (3.31); free Fe, Al, and dithionite (3.51), oxalate (3.52); and pyrophosphate (3.53). Available phosphorus was determined by the dilute H_2SO_4 (0.002 *N*) method described in *Soil chemical analysis*. Jackson, M. L., NJ: Prentice-Hall Inc.; 1958.

Baie-du-Vin Association

Soil unit:	BV2
Location:	lat. 46°35′33″ long. 64°48′14″
Parent material:	outwash or marine sand (sandy loam) over an easily split gray green sandstone bedrock
Slope:	2%
Aspect:	north
Elevation:	23 m AMSL
Drainage:	well drained
Classification:	Orthic Humo-Ferric Podzol

Horizon	*Depth (cm)*	*Description*
Ae	0–7	10YR 7/2; sandy loam to loamy sand; weak, medium subangular blocky; friable; irregular, abrupt; Ae 2–20 cm; pH 5.0
Bf	7–23	7.5YR 5/6; sandy loam; strong medium granular; very friable; wavy, abrupt; pH 5.0
Bfj	23–41	7.5YR 4/4; gravelly sandy loam; weak, coarse subangular blocky; very friable; 30% gravel; smooth, abrupt; pH 5.2
R	41+	easily split green gray sandstone bedrock

Note: 1. Gravel in the Bfj horizon consists of pieces of bedrock.
2. No analytical information available.

*American Society for Testing and Materials. The annual book of ASTM standards.

Table 18. Engineering test data for soil parent materials

		Soil classification		Atterberg limits			Sieve analysis					Specific gravity									
Soil	Depth cm	Unified	AASHO	LL	PL	PI	%Pass No. 10	%Pass No.40	%Pass No.200	% Silt	% Clay	Apparent (weighted)	Bulk store	% Water absorbed	Max. dry density PCF.	%Opt. moist.	%Voids at opt.	Voids ratio	% Porosity	% Potential moisture	Degree of sat. opt.	C.B.P. at opt.
Fundy	90–115	ML-CL	A-4 (2)	25	19	6	99	95	71.6	30	39	2.73	–	–	109.5	14.0	11.5	0.562	35.9	20.5	68.5	21
Fundy	90–100	CL	A-4 (6)	29	22	7	100	99	41.6	53.0	53.0	2.71	–	–	108.5	14.0	11.9	0.557	35.8	20.5	68.2	18
Fundy	90–100	CL	A-7-6 (16)	41	25	16	100	97	88.1	43.1	45.0	2.76	–	–	97.0	20.0	11.6	0.776	43.8	28.2	70.5	17
Gagetown	100–120	SP-SM	A-1-a	–	–	–	41	10	5.2	1	3	2.67	2.34	4.5	121.5	8.0	11.0	0.372	27.1	13.8	57.7	29
Gagetown	90–110	GP	A-1-a	–	–	–	32	8	0.4	–	–	2.67	2.60	1.5	126.0	3.0	23.3	0.305	23.4	11.6	25.8	21
Guimond River	85–110	SP-SM	A-1-b	–	–	–	59	26	6.7	4	3	2.66	2.25	5.8	117.0	12.0	7.1	0.417	29.5	15.8	75.3	26
Guimond River	90–100	SP	A-1-a	–	–	–	47	14	0.8	–	–	2.62	2.28	5.0	122.5	9.0	7.3	0.330	24.8	12.6	72.5	65
Harcourt		SM	A-4 (0)	21	17	4	78	69	42.6	13.0	27.0	2.48	2.10	7.4	118.5	12.0	–	–	–	–	–	24
Harcourt	80–100	SM-SC	A-2-4	21	16	5	76	66	33.0	9	22	2.70	2.27	5.6	121.0	10.0	9.0	0.396	28.5	15.2	67.7	13
Harcourt	90–100	SM-SC	A-4 (0)	23	16	7	90	80	43.5	19.5	24.0	2.68	2.26	5.4	118.0	11.5	8.8	0.424	29.7	15.7	73.2	16
Harcourt	90–100	SM-SC	A-4 (0)	21	15	6	69	62	37.9	20.0	17.9	2.68	2.27	5.3	120.0	10.0	10.2	0.416	29.4	15.3	65.3	16
Mount Hope	75–90	CL	A-4 (2)	29	20	9	63	58	53.8	30	24	2.80	2.61	2.9	122.5	11.0	8.2	0.433	30.1	15.3	71.3	24
Mount Hope	80–90	CL	A-6 (10)	33	21	12	99	98	88.1	36	52	2.79	–	–	109.5	15.0	10.3	0.588	36.5	20.7	72.2	21
Mount Hope	90–100	CL	A-6 (10)	34	22	12	100	98	87.7	37.7	50.0	2.71	–	–	110.0	11.0	15.7	0.542	35.2	19.8	55.0	33
Reece		SM-SC	A-4 (0)	22	16	5	82	71	36.7	12.0	23.0	2.76	2.36	6.1	119.5	11.0	–	–	–	–	–	16
Reece	80–90	SM-SC	A-4 (0)	20	16	4	82	71	36.9	13	24	2.70	2.44	4.0	121.5	12.0	4.8	0.399	28.4	14.7	83.0	15
Reece	90–100	SC	A-4 (0)	27	18	9	74	64	39.0	15.0	24.0	2.66	2.35	4.5	120.0	10.0	8.1	0.377	27.4	14.3	70.0	22
Reece	90–100	SM-SC	A-4 (0)	24	17	7	89	78	42.1	20.0	22.1	2.71	2.27	5.0	118.5	10.5	10.4	0.435	30.2	15.9	66.0	9
Richibucto		SP	A-3	–	–	–	100	71	2.0	0.5	1.5	–	–	–	99.0	14.5	–	–	–	–	–	15
Richibucto	110–140	SP	A-3	–	–	–	100	87	2.1	–	–	2.65	–	–	97.0	15.5	17.2	0.706	41.3	26.5	58.7	17
Richibucto	100–120	SM	A-3	–	–	–	99	29	1.1	–	–	2.65	–	–	97.5	13.5	20.1	0.693	41.0	26.2	48.5	7
Riverbank	90–110	SP-SM	A-3	–	–	–	92	53	6.5	1.5	5.0	2.67	–	–	108.0	12.0	14.6	0.547	35.0	20.2	59.4	18
Riverbank	90–100	SP	A-3	–	–	–	98	42	1.0	0.5	0.5	2.62	–	–	104.0	13.5	14.0	0.564	36.0	21.6	62.4	17
Rogersville	80–95	SM-SC	A-4 (0)	24	19	5	67	54	40.5	14	26	2.66	2.52	2.6	121.0	11.0	6.4	0.388	28.0	14.5	76.0	18
Rogersville	90–100	GM-GC	A-2-4	19	15	4	58	43	27.7	16.7	11.0	2.70	2.68	1.1	125.0	10.0	5.8	0.351	26.0	12.9	72.5	6
Rogersville	90–100	CL	A-4 (2)	24	15	9	87	76	57.1	34.1	23.0	2.71	2.61	1.8	116.5	12.5	9.0	0.450	31.0	16.6	75.2	12
Rogersville	90–100	SM-SC	A-4 (0)	23	16	7	83	72	42.2	18.4	24.0	2.68	2.36	4.4	118.0	12.0	6.9	0.423	29.7	15.7	76.7	17
Sunbury		SW-SM	A-2-4	–	–	–	68	57	10.7	5.0	3.0	2.58	2.20	6.7	114.5	10.0	–	–	–	–	–	41
Sunbury	85–100	GW-GM	A-1-a	–	–	–	32	27	11.4	5.4	6.0	2.63	2.29	5.1	–	–	–	–	–	–	–	–
Sunbury	85–100	SP-SM	A-1-a	–	–	–	24	17	6.0	3.0	3.0	2.63	2.28	5.2	–	–	–	–	–	–	–	–

%Voids at optimum, voids ratio, porosity, potential moisture, and degree of saturation were calculated from moisture density relations data.

Baie-du-Vin Association

Soil unit:	BV7
Location:	lat. 46°35'41" long. 64°44'26"
Parent material:	marine or outwash deposited sand over gray sandstone bedrock
Slope:	0%
Aspect:	N/A*
Elevation:	3 m AMSL
Drainage:	poor
Classification:	Orthic Gleysol

Horizon	*Depth (cm)*	*Description*
LFH	8–0	not described
Aegj	0–10	2.5Y 7/2 with common, medium, distinct 10YR 5/4 mottling; loamy sand; moderate, medium, granular; friable; range 8–15 cm; wavy, abrupt
Bg1	10–28	2.5Y 3/2 with many, fine, prominent 10YR 5/5 mottles; loamy sand; weak, medium, granular; very friable; range 15–20 cm; smooth, clear; pH 4.9
Bg2	28–45	2.5Y 4/4 with many, coarse, prominent 10YR 3/4 mottling; loamy sand; weak, fine, subangular blocky; firm to friable; range 15–20 cm; smooth, clear
R	45 +	easily split gray sandstone bedrock

Note: 1. The whole profile is strongly acid.
2. No analytical information available.
*Not applicable.

Barrieau Association

Soil unit:	BA2
Location:	lat. 46°37'47" long. 64°53'03"
Parent material:	fine marine sand (or outwash) over reddish fine loamy lodgment till
Slope:	8%
Aspect:	east
Elevation:	8 m AMSL
Drainage:	well drained
Classification:	Podzolic Gray Luvisol

Horizon	*Depth (cm)*	*Description*
LFH	6–0	5YR 2/1; mostly H and F; smooth, abrupt; pH 4.5
Ae	0–3	5YR 5/2; sandy loam to loamy sand; weak, fine subangular blocky; friable; wavy, abrupt; pH 4.8
Bhf	3–5	5YR 3/3; sandy loam; strong, fine subangular blocky; very friable; wavy, abrupt, pH 5.2
Bf	5–30	7.5YR 4/5; sandy loam; weak, medium granular; very friable; wavy, abrupt; pH 5.2
B + IIB	30–43	10YR 4/4 and 5YR 4/4; gravelly sandy loam; 20% gravel; weak, fine subangular blocky; friable; smooth, abrupt; pH 4.6
IIBt	43–75	5YR 3/3; sandy clay loam; strong, medium subangular blocky; firm; many clay films on ped surfaces; smooth, abrupt; pH 5.0
IIC	75 +	5YR 4/3; sandy clay loam; moderate, coarse platy; firm; few clay films on ped surface; pH 5.0

Note: 1. No analytical information available.

Barrieau Association

Soil unit:	BA2
Location:	lat. 46°35'33" long. 64°48'14"
Parent material:	outwash gravelly sandy loam over a fine loamy lodgment till
Slope:	2%
Aspect:	north
Elevation:	24 m AMSL
Drainage:	well drained
Classification:	Eluviated Dystric Brunisol

Horizon	*Depth (cm)*	*Description*
Ae	0–7	10YR 7/2; sandy loam; weak, medium subangular blocky; friable; Ae 2–20 cm; irregular, abrupt; pH 5.0
Bfj	7–23	7.5YR 5/6; sandy loam; strong medium granular; very friable; wavy, abrupt; pH 5.0
BC	23–41	7.5YR 4/4; gravelly sandy loam; weak, coarse subangular blocky; very friable; 30% gravel; smooth, abrupt; pH 5.2
IICg	41–75	5YR 4/4, many 5Y 4/3 and 5GY 6/1 mottles; clay loam; moderate, coarse subangular blocky; common, moderately thick clay films along peds; pH 5.4

Note: 1. There is a stone line between BC and IICg, mainly green sandstones with very few shales.

Soil unit BA2

Horizon	Depth cm	Mechanical analysis Sand fraction % 2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	% Pore space Macro	Micro	Total	% Moisture 10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	Hydraulic conductivity cm/hr
Ae	0–7						64.8	25.8	9.4	SL									
Bfj	7–23						71.5	16.4	12.1	SL									
BC	23–41						73.2	12.2	14.6	SL									
IICg	41						25.0	40.2	34.8	CL									

Horizon	Depth cm	pH H_2O	pH $CaCl_2$	Org. C %	Exchangeable cations Ca	Mg	Al	K	% Free Fe and Al: Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available P (ppm)
Ae	0–7			0.2							0.1	0.1			
Bfj	7–23			1.1							0.2	0.4			
BC	23–41			0.5							0.1	0.3			
IICg	41			0.2							0.2	0.2			

Barrieau Association

Soil unit: BA7
Location: lat. 46°58′51″ long. 65°06′44″
Parent material: marine or outwash sand over fine loamy lodgment till
Slope: 0%
Aspect: N/A
Elevation: 17 m AMSL
Drainage: poor
Classification: Fera Gleysol

Horizon	*Depth (cm)*	*Description*
LFH	7–0	not described
Aeg	0–12	7.5YR 6/2 with common, medium, prominent 7.5YR 5/6 mottling; sandy loam; weak, fine platy; friable to firm; wavy, abrupt
Bgfcc	12–24	5YR 2/1, inside concretion is 7.5YR 4/5; gravelly sandy loam; strong, coarse granular; friable; wavy, clear
BCgj	24–43	7.5YR 4/4 with many, medium distinct 7.5YR 5/6 mottles; gravelly sandy loam; moderate, fine subangular blocky; friable; smooth, abrupt
IICg	43+	7.5YR 4.5/3 with many, medium, prominent 7.5YR 5/6 and few, fine, prominent 5GY 6/1 mottles; sandy clay loam to clay loam; weak, medium platy; firm to very firm

Soil unit BA7

Horizon	Depth cm	Mechanical analysis Sand fraction % 2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	% Pore space Macro	Micro	Total	% Moisture 10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	Hydraulic conductivity cm/hr
Bgfcc	12–24						70.9	20.6	8.6	SL									

Horizon	Depth cm	pH H_2O	pH $CaCl_2$	Org. C %	Exchangeable cations Ca	Mg	Al	K	% Free Fe and Al: Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available P (ppm)
Bgfcc	12–24			2.8									1.2	0.4	

Big Hole Association

Soil unit:	BH2
Location:	lat. 46°53'39" long. 65°27'10"
Parent material:	shallow coarse loamy ablational till over easily split sandstone bedrock
Slope:	1.5%
Aspect:	north
Elevation:	30 m AMSL
Drainage:	well drained
Classification:	Orthic Humo-Ferric Podzol

Horizon	*Depth (cm)*	*Description*
FH	2–0	black; dominated by charcoal fragments with some semidecomposed and well-decomposed organic material
Ae	0–11	7.5YR 6/2.5; loamy sand to sandy loam; weak, fine and medium, subangular blocky; friable; 10% coarse fragments—mostly gravel size with a few weathered gneiss and granitic rock fragments; abrupt, broken
Bf1	11–17	6.5YR 5/7; sandy loam; weak, fine, subangular blocky; very friable; 10–15% coarse fragments—mostly gravel with some cobbles; clear, wavy
Bf2	17–24	9YR 5/6; sandy loam to loam; common, fine and medium, faint 7.5YR 5/6 mottles; weak, fine and medium subangular blocky; very friable; 15% coarse fragments—mostly gravel and cobbles; clear, wavy
BC	24–40	10YR 4/4; gravelly loamy sand; single grain; loose and very friable, but slightly firm in situ; 30–40% coarse fragments—mostly gravel and cobbles with a few stones; abrupt, smooth
R	40+	easily split Pennsylvanian sandstone

Note: 1. Aside from a few granitic and metamorphic rocks in the Ae and Bf1 horizons, the rest of the coarse fragments throughout the profile are subangular and platy Pennsylvanian sandstone.

Soil unit BH2

		Mechanical analysis Sand fraction %									Bulk	% Pore space			% Moisture				Hydraulic
Horizon	Depth cm	2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	density g/cm³	Macro	Micro	Total	10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	conductivity cm/hr
Bf1	11–17	6.0	11.4	18.3	12.2	4.9	52.9	35.2	11.9	SL									
Bf2	17–24	4.1	9.6	18.7	13.6	5.1	51.2	40.8	8.1	L									

									% Free Fe and Al						
	Depth	pH		Org. C	Exchangeable cations				Dithionate		Oxalate		Pyrophosphate		Available P
Horizon	cm	H_2O	$CaCl_2$	%	Ca	Mg	Al	K	Fe	Al	Fe	Al	Fe	Al	(ppm)
Bf1	11–17	4.4	3.7	4.3	0.3	0.1	2.0	0.1	3.0	1.3	2.0	0.4	0.9	0.6	3.9
Bf2	17–24	4.4	4.1	2.0	0.1	0.0	1.1	0.1	0.8	0.5	0.6	0.7	0.3	0.4	3.6

Big Hole Association

Soil unit:	BH4
Location:	lat. 46°53′49″ long. 65°27′10″
Parent material:	shallow coarse loamy ablational till over easily split sandstone bedrock
Slope:	2%
Aspect:	west
Elevation:	28 m AMSL
Drainage:	imperfect
Classification:	Gleyed Humo-Ferric Podzol

Horizon	*Depth (cm)*	*Description*
FH	4–0	2YR 3/4 plus 2YR 2/2; mostly semidecomposed and well-decomposed woody material with many charcoal fragments (produced by a fire)
Ae	0–13	7.5YR 6/3; loamy sand; weak, fine, subangular blocky; friable; 10% coarse fragments—mostly cobbles and gravel; abrupt, wavy
Bfgj1	13–23	6YR 5/7; sandy loam; many fine, faint 7.5YR 5/6 mottles; weak, fine, subangular blocky; friable, but with approximately 10% by volume weakly cemented; 20% coarse fragments—mostly cobble and gravel size; clear, wavy (there is a very thin discontinuous layer of 2.5YR 3/4 between horizons Bfgj1 and Ae)
Bfgj2	23–30	7.5YR 5/5.5; sandy loam to loamy sand; many fine, distinct 7.5YR 5/4 and a few fine, distinct 5YR 5/7 mottles; very weak, fine, subangular blocky; friable; 25% coarse fragments—mostly cobble and gravel size; clear, smooth
BC	30–39	10YR 4/4; gravelly loamy sand; single grain to very weak, fine subangular blocky; loose to very friable; 30–40% coarse fragments—mostly cobble and gravel size
R	39+	easily split Pennyslvanian sandstone

Note: 1. The coarse fragments are dominated by subangular and subrounded shapes, and except for horizons Ae and Bfgj1, which have a few granitic and metamorphic rocks, the coarse fragments are exclusively Pennsylvanian sandstone.
2. No analytical information.

Buctouche Association

Soil unit:	BU2
Location:	lat. 46°39′19″ long. 64°45′39″
Parent material:	marine or outwash sand over fine loamy lodgment till
Slope:	0.5%
Aspect:	east
Elevation:	less than 8 m AMSL
Drainage:	well drained
Classification:	Orthic Humo-Ferric Podzol

Horizon	*Depth (cm)*	*Description*
Ap	0–27	10YR 4.5/4; fine loamy sand to sandy loam: moderate, fine and medium granular; very friable; abrupt, smooth
Ae	27–29	7.5YR 6/2; fine loamy sand; weak, fine granular; very friable; abrupt, broken
Bf	29–47	7.5YR 5/6; fine loamy sand to sandy loam; moderate, fine subangular blocky; very friable; abrupt wavy
BC	47–53	8.5YR 5/4; fine loamy sand; moderate, fine and medium, subangular blocky; very friable; abrupt, smooth
IIC	53–100	5YR 4/4; sandy clay loam; moderate to strong, medium, platy or subangular blocky; very firm

Note: 1. Very strongly acid to strongly acid throughout the profile.

Soil unit BU2

Horizon	Depth cm	Mechanical analysis Sand fraction % 2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	% Pore space Macro	Micro	Total	% Moisture 10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	Hydraulic conductivity cm/hr
Ae	27–29	0.6	8.1	21.3	28.5	8.9	67.4	29.0	3.6										
Bf	29–47	0.8	8.2	18.2	35.2	7.6	69.9	17.9	12.2										

Horizon	Depth cm	pH H_2O	pH $CaCl_2$	Org. C %	Exchangeable cations Ca	Mg	Al	K	% Free Fe and Al Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available P (ppm)
Ae	27–29	5.2	4.3	0.35									0.2	0.1	
Bf	29–47	5.4	4.6	1.36									0.5	0.5	

Buctouche Association

Soil unit: BU2
Location: lat. 46°38′54″ long. 65°13′41″
Parent material: outwash sand over fine loamy lodgment till
Slope: 3%
Aspect: southeast
Elevation: 60 m AMSL
Drainage: well drained
Classification: Orthic Humo-Ferric Podzol

Horizon	*Depth (cm)*	*Description*
Ap	0–16	7.5YR 5/4; fine sand to loamy sand; very weak, fine granular; very friable; abrupt, smooth
Ae	16–18	7.5YR 7/2; fine sand; very weak, fine subangular blocky; very friable; abrupt, broken
Bf	18–45	7.5YR 5/7; fine loamy sand; weak, fine, granular; very friable; abrupt, smooth
C	45–90	10YR 4.5/5; fine sand; structureless; loose; abrupt, smooth
IIC	90+	5YR 4/4; sandy clay loam; moderate to strong, medium, platy or subangular blocky; very firm

Note: 1. Very strongly acid to strongly acid throughout the profile.

Soil unit BU2

Horizon	Depth cm	Mechanical analysis Sand fraction % 2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	% Pore space Macro	Micro	Total	% Moisture 10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	Hydraulic conductivity cm/hr
Bf	18–45	0.4	18.1	31.1	34.2	2.9	86.7	3.3	10.0										
C	45–90	0.2	11.2	32.6	47.2	5.0	96.1	2.6	1.3										

Horizon	Depth cm	pH H_2O	pH $CaCl_2$	Org. C %	Exchangeable cations Ca	Mg	Al	K	% Free Fe and Al Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available P (ppm)
Bf	18–45	4.8	4.4	2.6									0.9	0.9	
C	45–90	4.9	4.7	0.3									0.1	0.2	

Caraquet Association

Soil unit:	CR4
Location:	lat. 46°59′34″ long. 65°32′01″
Parent material:	outwash sand (riverbank) over lacustrine clay
Slope:	6%
Aspect:	southeast
Elevation:	20 m AMSL
Drainage:	imperfect
Classification:	Gleyed Humo-Ferric Podzol

Horizon	*Depth (cm)*	*Description*
Ap	0–18	10YR 3/3; sandy loam; moderate, fine to medium, granular; very friable; abrupt, wavy; pH 5.0
Bfgj	18–26	7.5YR 5/7; sandy loam; common, medium, prominent 10YR 3/3 vertical streaks; few medium to coarse, prominent 10YR 3/3 blotches; common fine and medium, faint 7.5YR 4/6 mottles; weak, medium and coarse, granular; very friable; clear, wavy; pH 5.2
Bfj	26–37	10YR 5/7; loamy sand; few medium, prominent 10YR 3/3 vertical streaks; few coarse, prominent 10YR 3/3 blotches; very weak, coarse, granular; very friable; clear, wavy; pH 5.2
BC	37–51	10YR 5/5; loamy sand to sand; weak, fine and medium, subangular blocky; very friable; gradual, wavy; pH 5.2
C	51–68	8.5YR 4.5/5; sand; moderate to weak, medium, subangular blocky; very friable; abrupt, wavy; pH 5.3
IIC1	68–76	10YR 5/4; sandy silt loam; common, medium, distinct streaks of 10YR 7/2 surrounded by 10YR 5/6; strong, coarse, subangular blocky; very firm in situ, firm on excavation; common, thin clay films on ped surfaces; a few rounded gravel fragments of sandstone and some foreign material (see Note 1) and one or two flat, angular cobbles of sandstone; clear, wavy; pH 5.2 (this horizon is the transition zone from C to IIC; it is a mixing of the two)
IIC2	76+	10YR 4/4; silty clay loam; common, medium to fine, distinct streaks of 10YR 6/3 surrounded by 10YR 5/7; strong, medium to coarse, platy; very firm in situ, firm on excavation; plastic; sticky; many thin to moderately thick clay films on ped surfaces and on pore walls; few very thin to thin manganese coatings on ped surfaces; the occasional subrounded gravel fragment of sandstone or foreign material; pH 5.3

Note: 1. Typically members of the Caraquet association are marine sand over marine or lacustrine clay.
2. Foreign material refers to fragments of granitic, metamorphic (gneiss, schist, slate, and argillite), and some volcanic rocks.
3. There are remnants of an Ae horizon in the areas adjacent to this description site.*
4. No analytical information available.

*Ae 10YR 7/2; loamy sand; common medium, prominent 10YR 3/3 streaks and common medium, prominent 10YR 3/3 blotches; weak, medium, subangular blocky; very friable; abrupt, broken; pH 5.1

Fair Isle Association

Soil unit:	FA2
Location:	lat. 46°32′15″ long. 65°06′06″
Parent material:	coarse loamy ablation till over easily split sandstone bedrock
Slope:	10%
Aspect:	east
Elevation:	30 m AMSL
Drainage:	well drained
Classification:	Orthic Humo-Ferric Podzol or Eluviated Dystric Brunisol

Horizon	*Depth (cm)*	*Description*
Ap	0–23	10YR 4/3; sandy loam; weak to moderate, fine to medium, subangular blocky; friable; abrupt, smooth
Ae	23–24	10YR 7/2; sandy loam; weak, fine subangular blocky; very friable; 5% thin flat sandstone fragments of cobble size; abrupt, broken

Horizon	*Depth (cm)*	*Description*
Bf or Bfj	24–48	7.5YR 5/6; sandy loam; weak, medium granular; very friable; 5% thin flat sandstone fragments of cobble size; abrupt, wavy
BC	48–67	10YR 5/4; gravelly sandy loam; weak, fine subangular blocky; friable; discontinuous portions of the horizon are weakly cemented; 20% thin flat sandstone fragments of cobble size; gradual, smooth
C	67–90	2.5Y 4/3; gravelly sandy loam; weak to moderate, medium to coarse subangular blocky; firm; 20% thin flat sandstone fragments of cobble size; abrupt, smooth
R	90+	easily split Pennsylvanian green gray sandstone

Soil unit FA2

Horizon	Depth cm	Mechanical analysis Sand fraction % 2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	% Pore space Macro*	Micro*	Total	% Moisture 10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	Hydraulic conductivity cm/hr
Ap	0–23	6.1	22.4	13.9	20.0	6.0	68.5	18.2	13.4	SL	1.24	16.7	36.6	53.2	37.3	29.6		9.5	
Ae	23–24	5.8	26.9	10.5	16.6	6.7	66.6	27.4	6.1	SL									
Bf	24–48	14.7	29.4	8.5	13.9	6.2	72.6	20.0	7.4	SL									
BC	48–67	6.5	25.1	14.5	18.7	5.3	70.1	20.4	9.6	SL									
C	67–90	4.9	12.6	13.8	27.3	8.9	67.6	20.1	12.3	SL	1.51	15.1	24.7	39.7	23.3	16.5		4.1	8.0
R	90																		

Horizon	Depth cm	pH H_2O	pH $CaCl_2$	Org. C %	Exchangeable cations Ca	Mg	Al	K	% Free Fe and Al Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available P (ppm)
Ap	0–23	4.6	4.3	4.2	1.6	0.1	0.3	0.1	1.2	0.6	0.5	0.5	0.4	0.3	11.2
Ae	23–24	4.0	3.7	0.3	0.5	0.1	2.4	0.1	0.3	0.1	0.1	0.1	0.1	0.1	5.9
Bf	24–28			1.0	0.1	0.0	0.3	0.1	1.4	0.8	0.5	0.8	0.3	0.3	5.3
BC	48–67	4.1	4.0	0.2	0.2	0.0	0.9	0.1	0.8	0.3	0.2	0.2	0.2	0.2	2.1
C	67–90	4.1	3.8	0.2	0.2	0.1	1.6	0.1	0.7	0.2	0.2	0.2	0.2	0.2	3.5
R	90														

*At a tension of 50 cm of H_2O, the micropores retain their water while the macropores do not.

Fair Isle Association

Soil unit: FA4
Location: lat. 46°53′51″ long. 65°27′14″
Parent material: coarse loamy ablational till over easily split sandstone bedrock
Slope: 2%
Aspect: west
Elevation: 27 m AMSL
Drainage: imperfect
Classification: Gleyed Humo-Ferric Podzol

Horizon	*Depth (cm)*	*Description*
Of	4–0	2.5YR 3/4; mostly semidecomposed moss
Oh	trace	2.5YR 2.5/2; well-decomposed moss and also many charcoal fragments (produced by a fire)
Ae	0–16	5YR 6/2.5; gravelly sandy loam; very weak, fine subangular blocky; friable to very friable; 20% gravel and 20% cobbles, mostly subangular and subrounded Pennsylvanian sandstone with a few nonsandstone rocks such as gneiss and granite; abrupt, wavy
Bfgj	16–30	7.5YR 5/7; sandy loam; pockets of 2.5YR 3/4 in the upper half of the horizon, common, coarse, prominent 10YR 4/4 mottles in the lower half of the horizon; moderate, fine subangular blocky; friable, but about 20% by volume appear to be moderately cemented—the cemented soil peds are firm

		to very firm; 40% coarse fragments—mostly cobble size, but some of stone size and about 10% gravel sandstone; clear, wavy	Cgj	50–75	Pennsylvanian sandstone; gradual, smooth 10YR 4/4; loamy sand; many fine, faint 10YR 5/5 mottles; single grain to very
BCgj	30–50	2Y 4/4; gravelly loamy sand; many fine, distinct 10YR 5/6 mottles; very weak, fine, subangular blocky; friable to loose; 50% coarse fragments—mostly cobble and gravel size with some stone size, mostly			weak, fine, subangular blocky; loose and very friable; 60% coarse fragments—mostly cobbles, but some stones and gravel, all are sandstone
			R	75+	easily split Pennsylvanian sandstone

Soil unit FA4

		Mechanical analysis Sand fraction %										% Pore space			% Moisture				Hydraulic conductivity
Horizon	Depth cm	2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	Macro	Micro	Total	10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	cm/hr
Ae	0–16	1.1	4.8	29.4	30.5	6.3	72.2	24.0	3.9	SL									
Bfgj	16–30	7.8	13.4	26.6	20.7	7.5	75.9	16.8	7.3	SL									
Cgj	50–75	5.9	10.2	28.5	24.6	6.0	75.3	21.1	3.7	LS									

		pH		Org. C	Exchangeable cations				% Free Fe and Al						Available P
									Dithionate		Oxalate		Pyrophosphate		
Horizon	Depth cm	H_2O	$CaCl_2$	%	Ca	Mg	Al	K	Fe	Al	Fe	Al	Fe	Al	(ppm)
Ae	0–16	4.4	3.1	0.7	0.4	0.1	2.0	0.1	0.4	0.1	0.1	0.1	0.1	0.0	1.2
Bfgj	16–30	4.5	4.1	3.0	0.2	0.4	0.4	0.1	2.4	1.4	2.1	2.9	0.6	0.5	2.1
Cgj	50–75	4.6	4.3	0.3	0.1	0.0	0.2	0.0	0.6	0.3	0.2	0.4	0.0	0.1	3.1

Fundy Association

Soil unit: FU4
Location: lat. 47°00′58″ long. 65°24′55″
Parent material: lacustrine silty clay
Slope: 3%
Aspect: south
Elevation: 11 m AMSL
Drainage: imperfect
Classification: Gleyed Brunisolic Gray Luvisol

Horizon	*Depth (cm)*	*Description*
Ap	0–20	10YR 5/3.5; loam; common fine, distinct 10YR 6/6 mottles; moderate, fine, subangular blocky; friable; abrupt, smooth
Bmgj	Pocket	7.5YR 5/7; fine sandy loam or coarse silt loam; common, fine, distinct 7.5YR 5/5 mottles; moderate, fine subangular blocky; very friable; abrupt, broken (only one pocket of Bmgj was observed)
Aegj	20–29	10YR 5/3; loam; common coarse prominent 10YR 5/6 and few fine, prominent 7.5YR 5/8 mottles; weak, medium and fine, subangular blocky; friable; abrupt, wavy (there are a few subangular sandstone gravels between horizons Aegj and Btgj; coarse fragments are more common here than in the rest of the profile)
Btgj	29–70	7YR 5/4; clay loam; common medium, distinct, 7YR 5/6 mottles; moderate, medium platy in situ breaking into moderate, medium, blocky when excavated; very sticky and plastic, very firm; many moderately thick clay films along the ped surfaces; many black manganese specks between the peds; clear, smooth

Horizon	*Depth (cm)*	*Description*
C1	70–100	7.5YR 4.5/4; silty clay; common medium, faint 7.5YR 5/5 mottles; moderate, coarse platy; very sticky, plastic, very firm; few thin clay films along the ped surface; many black manganese specks along the ped surface; diffuse, smooth
C2	100–160+	7.5YR 4/4; silty clay; weak, coarse platy; sticky, plastic, very firm; common black manganese specks on ped surfaces

Note: 1. There is a small amount of gravel, mostly subangular or subrounded Pennsylvanian sandstone, throughout the profile.

Soil unit FU4

Horizon	Depth cm	Mechanical analysis Sand fraction % 2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	% Pore space Macro*	Micro*	Total	% Moisture 10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	Hydraulic conductivity cm/hr
Ap	0–20	1.0	2.7	12.5	17.3	6.5	40.0	41.5	18.5	L	1.21	15.0	37.1	52.1	40.0	35.1	30.8	10	25.4
Aegj	20–29	0.6	2.4	13.2	21.6	7.3	45.1	41.1	13.8	L									
Btgj	29–70	0.1	0.6	5.2	12.1	7.1	25.1	40.2	34.7	CL	1.71	7.0	26.8	33.8	17.7	16.7	15.7	14	0.01
C1	70–100	0.0	0.1	0.7	2.1	2.0	5.0	54.6	40.5	SiC									
C2	100	0.0	0.1	0.6	1.8	1.8	4.3	53.3	42.5	SiC									

Horizon	Depth cm	pH H_2O	pH $CaCl_2$	Org. C %	Exchangeable cations Ca	Mg	Al	K	% Free Fe and Al Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available P (ppm)
Ap	0–20	4.6	4.0	2.8	1.6	1.1	1.0	0.1	1.4	0.3	0.7	0.2	0.6	0.2	12.7
Aegj	20–29	4.4	3.8	0.5	0.5	0.2	1.8	0.1	0.9	0.1	0.3	0.2	0.2	0.1	3.8
Btgj	29–70	4.6	3.9	0.2	2.9	4.7	1.0	0.2	1.8	0.1	0.8	0.3	0.3	0.2	20.7
C1	70–100	6.0	5.3	0.1					2.2	0.1	0.9	0.3	0.1	0.1	142.8
C2	100–160	6.2	5.5	0.1	6.0	8.2		0.2	2.5	0.1	0.7	0.3	0.0	0.0	176.0

*At a tension of 50 cm of H_2O, the micropores retain their water while the macropores do not.

Fundy Association

Soil unit: FU4
Location: lat. 46°52′45″ long. 65°33′39″
Parent material: lacustrine silty clay loam
Slope: 4-5%
Aspect: west
Elevation: 27 m AMSL
Drainage: imperfect
Classification: Gleyed Podzolic Gray Luvisol

Horizon	*Depth (cm)*	*Description*
LFH	6–0	composed of dead grasses, sphagnum moss, ferns, roots, fir and spruce needles, and birch, aspen, and alder leaves; pH 4.1
Ahe	0–5	10YR 4/3; silt loam; moderate, fine, granular with some weak, coarse, granular; very friable; no coarse fragments; abrupt, wavy
Bfgj	5–15	10YR 5/6; silt loam; common coarse, distinct 10YR 6/4 mottling; moderate, fine, granular with some weak, coarse, granular; very friable; no coarse fragments; clear, wavy
Bmgj	15–24	10YR 5/4; silt loam; common fine, prominent 10YR 5/8 and common medium, faint 10YR 6/4 mottling with common fine, prominent 10YR 5/8 bands; moderate, fine and medium, granular; very friable; no coarse fragments; gradual, wavy

Ae	24–31	10YR 6/3; silt loam; moderate, medium platy; firm in situ, firm to friable on excavation; sand skeletons of very fine sand between plates; 1% coarse fragments—rounded gravel of foreign material (see note 1); clear, irregular
Btj	31–54	10YR 4/3; silty clay loam; strong, coarse and medium, platy in situ, strong, medium and coarse, angular blocky on excavation; very firm in situ, very firm to firm on excavation; slightly sticky to sticky, slightly plastic to plastic; many to common thin clay films on ped surfaces; no coarse fragments; gradual, wavy
Bt	54–86	10YR 4/3; silty clay loam; strong, coarse and medium, platy in situ, strong coarse and medium, angular blocky on excavation; very firm in situ, very firm to firm on excavation; very sticky, very plastic; many continuous, moderately thick clay films on ped surfaces; no coarse fragments; gradual, wavy
C	86+	10YR 4/3; silty clay loam; massive in situ, breaking into strong coarse, platy on excavation; very firm in situ, firm on excavation; sticky; very plastic; many thin clay films on ped surfaces; common very thin manganese coatings on ped surfaces; no coarse fragments

Note: 1. Foreign material refers to fragments of granitic, metamorphic (gneiss, schist, slate, and argillite), and some volcanic rocks.

Soil unit FU4

Horizon	Depth cm	Mechanical analysis Sand fraction % 2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	% Pore space Macro*	Micro*	Total	% Moisture 10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	Hydraulic conductivity cm/hr
Ahe	0–5	0.8	2.2	2.3	2.4	3.6	11.3	66.1	22.6	SiL									
Bfgj	5–15	1.0	3.5	3.1	2.4	3.6	13.6	62.7	23.7	SiL	1.08	20.2	37.4	57.6	51.5	44.2	34.7	12.7	10.9
Bmgj	15–24	0.4	1.4	2.2	2.4	5.0	11.4	69.3	19.3	SiL									
Ae	24–31	0.1	0.7	1.8	2.5	4.5	9.5	71.9	18.7	SiL									
Btj	31–54	0.1	0.1	0.6	1.3	3.6	4.7	61.4	32.9	SiCL		5.5	35.7	41.2	23.9	22.7	21.2	13.6	0.05
Bt	54–86	0.1	0.1	0.2	1.0	3.7	5.1	58.3	36.6	SiCL									
C	86	0.0	0.0	0.2	0.6	2.7	3.5	59.8	36.8	SiCL									

Horizon	Depth cm	pH H_2O	pH $CaCl_2$	Org. C %	Exchangeable cations Ca	Mg	Al	K	% Free Fe and Al Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available P (ppm)
Ahe	0–5	4.4	4.0	2.8	0.4	0.3	5.2	0.3	2.1	0.5	1.2	0.5	0.8	0.4	3.6
Bfgj	5–15	4.9	4.3	2.3	0.3	0.1	3.1	0.2	2.7	0.7	1.7	0.8	1.0	0.6	4.7
Bmgj	15–24	5.0	4.5	1.3	0.2	0.1	1.1	0.2	1.4	0.5	0.7	0.6	0.5	0.4	5.9
Ae	24–31	4.9	4.3	0.3	0.3	0.0	2.1	0.2	1.1	0.2	0.3	0.3	0.1	0.1	3.3
Btj	31–54	4.9	4.2	0.3	0.5	2.9	2.0	0.2	1.5	0.2	0.4	0.2	0.1	0.1	10.0
Bt	54–86	4.8	5.1	0.2					1.6	0.1	0.3	0.1	0.0	0.0	62.2
C	86	6.1	5.5	0.1	5.8	7.0	0.0	0.1	1.6	0.1	0.3	0.1	0.0	0.0	100.0

*At a tension of 50 cm of H_2O, the micropores retain their water while the macropores do not.

Fundy Association

Soil unit:	FU7
Location:	lat. 47°00'55" long. 65°24'50"
Parent material:	lacustrine silty clay loam
Slope:	3%
Aspect:	south
Elevation:	8 m AMSL
Drainage:	poor
Classification:	Orthic Luvic Gleysol

Horizon	*Depth (cm)*	*Description*
Apg	0–18	10YR 5/2.5; fine sandy loam; common, medium, prominent 8YR 5/7 mottles; weak to moderate, fine subangular blocky; friable; abrupt, smooth
Aegj	18–30	8YR 5/4; silt loam; many medium and coarse, distinct 8YR 5/6 mottles; moderate, medium, subangular blocky; friable to firm; many very fine sand skeletons along the ped surface; clear, wavy
Btgj	30–85	7YR 3/4; silty clay loam; many medium and coarse, faint 7YR 4/5 mottles; moderate to strong, medium, platy breaking into moderate, coarse subangular blocky; very sticky and plastic, very firm, compact; many moderately thick clay films along the ped surface, root channels, and walls of voids; many manganese specks between the peds; gradual, smooth
Cg	85–110+	7.5YR 4/4; silty clay loam; common medium, prominent 7.5YR 5/8 mottles; weak, coarse platy; sticky, plastic, firm, compact (very hard when dry); few thin clay films along the ped surface; many black manganese specks between the peds

Note: 1. There are very few rounded or subrounded sandstone gravels throughout the profile.
2. No analytical information available.

Gagetown Association

Soil unit:	G1
Location:	lat. 46°53'59" long. 65°37'37"
Parent material:	outwash sandy gravel
Slope:	2%
Aspect:	north
Elevation:	6 m AMSL
Drainage:	excessive to well drained
Classification:	Orthic Humo-Ferric Podzol

Horizon	*Depth (cm)*	*Description*
Ap	0–18	10YR 3/3; sandy loam to loamy sand; weak, fine, granular, very friable; 10% subrounded and rounded gravel of foreign material (see note 1); abrupt, smooth; pH 5.3
Ae	18–23	10YR 7/2; gravelly loamy sand; common fine and medium, prominent 10YR 4/3 mottles; very weak, fine granular; very friable; 20-25% rounded and subrounded gravel of foreign material; abrupt, broken; pH 5.3
Bf	23–38	7.5YR 5/8; gravelly loamy sand to gravelly sandy loam; weak, fine and medium, granular; very friable; 25-30% rounded and subrounded gravel of foreign material; clear, wavy; pH 5.2
BC	38–55	10YR 5/6; very gravelly sand; single grain; loose; 45-55% rounded and subrounded gravel and 5-10% rounded and subrounded cobbles of foreign material; gradual to diffuse, wavy; pH 5.9
C	55+	10YR 5/4; very gravelly sand; common medium and coarse, prominently 7.5YR 5/8 horizontal bands; single grain; loose; 55-65% rounded and subrounded gravel and 5-10% rounded and subrounded cobbles of foreign material; pH 6.5

Note: 1. Foreign material refers to fragments of granitic, metamorphic (gneiss, schist, slate and argillite), and some volcanic rocks.
2. No analytical information available.

Soil unit G1

Horizon	Depth cm	Mechanical analysis Sand fraction % 2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	% Pore space Macro	Micro	Total	% Moisture 10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	Hydraulic conductivity cm/hr
Bf	3–30	2.5	15.4	31.0	21.3	5.8	76.0	15.8	8.2										
C	30–66	1.1	17.3	32.4	33.0	5.2	89.0	7.6	3.4										

Horizon	Depth cm	pH H_2O	pH $CaCl_2$	Org. C %	Exchangeable cations Ca	Mg	Al	K	% Free Fe and Al Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available P (ppm)
Bf	3–30	4.4	4.1	1.5									0.68	0.44	
C	30–66	4.8	4.5	0.37									0.08	0.19	

Galloway Association

Soil unit: GA1
Location: lat. 46°34′54″ long. 65°05′16″
Parent material: outwash sand over Pennsylvanian gray green sandstone
Slope: 2%
Aspect: north
Elevation: 9 m AMSL
Drainage: well drained to excessive
Classification: Orthic Humo-Ferric Podzol

Horizon	*Depth (cm)*	*Description*
LFH	5–0	predominantly L and F, consisting of feather moss, branches, and needles
Ae	0–3	7.5YR 7/3; fine loamy sand; weak, fine, granular; very friable; abrupt, broken
Bf	3–30	7.5YR 5/7; fine loamy sand; weak, fine, subangular blocky; very friable; 10% cobble, gravel, and stone-sized subangular and flat sandstone fragments; abrupt, wavy
C	30–66	10YR 4/4; fine sand; single grain; friable; 10-15% mostly gravel-sized, flat sandstone fragments; abrupt, smooth
R	66+	easily split Pennsylvanian gray green sandstone

Note: 1. Presence of flat sandstone fragments in the Bf and C horizons. These are from the bedrock and have been moved upward by frost action.

Galloway Association

Soil unit: GA2
Location: lat. 46°32′13″ long. 64°45′48″
Parent material: marine sand over easily split Pennsylvanian gray green sandstone
Slope: 1%
Aspect: south
Elevation: 23 m AMSL
Drainage: moderately well drained
Classification: Orthic Humo-Ferric Podzol

Horizon	*Depth (cm)*	*Description*
LFH	5–0	mostly white pine needles with charcoal
Ap	0–17	10YR 5.5/4; fine loamy sand; weak, medium granular and weak, fine subangular blocky; very friable; abrupt, smooth
Bf	17–30	9YR 5/6; fine loamy sand; weak, fine granular; very friable; about 5% cemented; clear, wavy
Cgj	30–51	10YR 5/4; many fine distinct 10YR 4/6 mottles; sand; structureless; firm to loose; abrupt, smooth
C	51–70	semiweathered sandstone bedrock
R	70+	easily split Pennsylvanian sandstone bedrock

Note: 1. Presence of ortstein (cemented portion of Bf horizon), which is common in the sandy-textured soils of this area.

Soil unit GA2

Horizon	Depth cm	Mechanical analysis Sand fraction % 2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	% Pore space Macro	Micro	Total	% Moisture 10 cm H₂O	50 cm H₂O	33 kPa	1500 kPa	Hydraulic conductivity cm/hr
Bf	17–30	0.4	11.8	37.8	28.3	4.2	82.4	7.7	9.9										
C	51–70	0.2	7.8	31.3	36.6	5.6	81.5	12.2	6.3										

Horizon	Depth cm	pH H_2O	pH $CaCl_2$	Org. C %	Exchangeable cations Ca	Mg	Al	K	% Free Fe and Al Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available P (ppm)
Bf	17–30	5.1	4.7	1.07									0.23	0.58	
C	51–70	5.1	4.5	0.43									0.18	0.31	

Galloway Association

Soil unit: GA4
Location: lat. 46°40′18″ long. 64°46′43″
Parent material: glacial outwash sand over easily split sandstone bedrock
Slope: 2%
Aspect: east
Elevation: 3 m AMSL
Drainage: imperfect
Classification: Gleyed Humo-Ferric Podzol

Horizon	*Depth (cm)*	*Description*
Ap	0–15	10YR 5/3; loamy sand; weak, fine, granular; very friable; abrupt, smooth; pH 4.8
Ae	15–23	10YR 7/2; loamy sand; weak, fine, subangular blocky; friable; abrupt, wavy; pH 4.8
Bfgj	23–50	5YR 5/7; with many coarse distinct 7.5YR 5/5.5 mottles; loamy sand; weak, fine, granular; very friable; a weakly cemented ortstein occurs over less than 30% of this horizon; abrupt, wavy; pH 5.6
Bfj	50–70	10YR 5/6; loamy sand; very weak, medium, subangular blocky; very friable; clear, smooth; pH 5.6
C	70–90	10YR 5/6; sand; single grain; loose, abrupt, smooth; pH 5.2
R	90+	easily split gray green Pennsylvanian sandstone bedrock

Note: 1. Presence of ortstein in the Bfg horizon. This is common in the sandy soils.
2. No analytical information available.

Guimond River Association

Soil unit: GR1
Location: lat. 46°37′31″ long. 64°49′34″
Parent material: gravelly sandy outwash
Slope: 2-4%
Aspect: northeast
Elevation: 30 m AMSL
Drainage: well drained to excessive
Classification: Orthic Humo-Ferric Podzol

Horizon	*Depth (cm)*	*Description*
LFH	7–0	predominantly L and F, consisting of leaves, branches, roots, feather moss, and running club-moss
Ae	0–12	10YR 6/2.5; fine sand; very weak, fine granular; very friable; 2% of rounded and subrounded sandstone gravel; abrupt, wavy
Bf	12–42	7.5YR 5/6; fine loamy sand; weak, fine granular; very friable; 5% of rounded and subrounded sandstone gravel; abrupt, wavy
C	42+	10YR 4/3; very gravelly sand; structureless; loose; more than half mostly rounded with some subrounded sandstone gravel fragments and a few cobbles

Soil unit GR1

Horizon	Depth cm	Mechanical analysis Sand fraction % 2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	% Pore space Macro	Micro	Total	% Moisture 10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	Hydraulic conductivity cm/hr
Ae	0–12	3.2	22.5	20.3	18.9	7.3	72.2	25.6	2.2										
Bf	12–42	4.7	28.1	14.8	16.8	4.3	68.7	20.0	11.3										
C	42	5.5	50.8	25.5	8.8	2.6	93.2	5.5	1.3										

Horizon	Depth cm	pH H_2O	pH $CaCl_2$	Org. C %	Exchangeable cations Ca	Mg	Al	K	% Free Fe and Al: Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available P (ppm)
Ae	0–12	4.1	3.2	0.7									0.03	0.05	
Bf	12–42	4.8	4.4	2.0									0.56	0.64	
C	42	4.7	4.2	0.1									0.04	0.10	

Guimond River Association

Soil unit: GR2
Location: lat. 46°46′26″ long. 64°57′56″
Parent material: gravel outwash
Slope: 1-3%
Aspect: east
Elevation: 29 m AMSL
Drainage: well drained
Classification: Orthic Humo-Ferric Podzol

Horizon	*Depth (cm)*	*Description*
Ap	0–17	10YR 3/3; sandy loam; strong medium granular; very friable; 10% gravel; smooth abrupt; pH 6.0
Bf	17–40	7.5YR 4/8; gravelly sandy loam; strong fine granular; very friable; 20% gravel; smooth abrupt; pH 6.0
BC	40–65	10YR 4/4; very gravelly loamy sand; single grain; loose; 50% gravel; smooth clear; pH 6.2
C	65–100	10YR 3/4; very gravelly sandy loam; single grain; loose; 80% gravel; pH 5.8

Note: 1. Most gravel fragments are soft rounded sandstone.

Soil unit GR2

Horizon	Depth cm	Mechanical analysis Sand fraction % 2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	% Pore space Macro	Micro	Total	% Moisture 10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	Hydraulic conductivity cm/hr
Ap	0–17						65.2	21.6	13.2	SL									
Bf	17–40						77.8	10.8	11.4	SL									
BC	40–65						86.0	7.1	6.9	LS									
C	65						77.6	12.9	9.5	SL									

Horizon	Depth cm	pH H_2O	pH $CaCl_2$	Org. C %	Exchangeable cations Ca	Mg	Al	K	% Free Fe and Al: Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available P (ppm)
Ap	0–17			2.6							0.3	0.3			
Bf	17–40			1.1							0.3	0.5			
BC	40–65			0.3							0.2	0.2			
C	65			0.2							0.2	0.2			

Harcourt Association

Soil unit: HT2
Location: lat. 46°35'25" long. 65°18'41"
Parent material: coarse loamy ablation till over fine loamy lodgment till
Slope: 1%
Aspect: south
Elevation: 80 m AMSL
Drainage: moderately well drained
Classification: Podzolic Gray Luvisol

Horizon	*Depth (cm)*	*Description*
LFH	3–0	not described
Ae	0–1	7.5YR 7/2; sandy loam; moderate, medium granular; very friable; 0-3 cm; broken, abrupt
Bf	1–26	7.5YR 5/6; sandy loam; strong, medium granular; very firm; wavy, abrupt
BC	26–35	7.5YR 5/4; sandy loam; moderate, coarse granular; friable; smooth, abrupt
IIBt	35–42	5YR 4/4; sandy loam to sandy clay loam; weak, medium platy; firm; smooth, clear
IIBtg	42+	5YR 4/4 with many coarse, prominent 7.5YR 5/6 mottles and common coarse, distinct streaks; sandy clay loam; moderate, medium platy; very firm

Note: 1. No analytical information available.

Harcourt Association

Soil unit: HT2
Location: lat. 46°36'05" long. 65°14'36"
Parent material: coarse loamy ablation till over fine loamy lodgment till
Slope: 1%
Aspect: north
Elevation: 76 m AMSL
Drainage: well drained
Classification: Podzolic Gray Luvisol

Horizon	*Depth (cm)*	*Description*
LF	4.5–3.5	5YR 3/1; consists of freshly fallen leaves and needles and partly decomposed leaves interwoven with yellow mycelia; matted; greasy
H	3.5–0	5YR 2/1; well-decomposed organic matter
Ae	0–2	5YR 6.5/2; loam; strong medium, granular; friable; very few subrounded gravel fragments of sandstone; abrupt, wavy (pockets of Ae extend downward to 8 cm)
Bf1	2–15	5YR 4/6; loam; strong granular breaking down to medium granular; friable; very few coarse fragments; clear, wavy
Bf2	15–27	7.5YR 4/4; sandy loam strong granular; friable; few angular gravel fragments of sandstone; abrupt, wavy
IIBm	27–39	7.5YR 4.5/2; loam; platy in situ breaking down to strong coarse granular; slightly firm; small grit fragments of soft sandstone with a few larger pieces of angular gravel sandstone; abrupt, wavy
IIBt	39–100	5YR 3.5/3; sandy clay loam; strong platy; firm; clay skins present; a few cobbles and some gravel fragments of sandstone
R	100+	Pennsylvanian gray green sandstone bedrock

Soil unit HT2

		Mechanical analysis Sand fraction %									Bulk	% Pore space			% Moisture				Hydraulic
Horizon	Depth cm	2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	density g/cm³	Macro*	Micro*	Total	10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	conductivity cm/hr
Ae	0–2	0.7	2.4	15.7	19.9	9.0	47.8	42.1	10.2	L	0.9	22.1	41.5	63.6	60.3	46.4		13.4	48.7
Bf1	2–15	4.8	3.5	8.1	21.7	8.6	46.7	37.3	16.0	L									
Bf2	15–27	3.5	3.0	11.4	26.7	8.4	53.0	28.4	18.7	SL	1.1	9.6	46.2	55.8	47.2	42.1		10.6	6.4
IIBm	27–39	0.9	2.0	14.0	22.2	8.7	47.9	35.9	16.3	L	1.6	5.5	34.0	39.4	22.9	21.3		5.6	1.3
IIBt	39–100	0.4	2.0	19.4	21.3	6.3	49.2	26.1	24.6	SCL	1.8	5.1	27.9	33.0	16.4	15.3		8.0	0.1

Horizon	Depth cm	pH H_2O	pH $CaCl_2$	Org. C %	Exchangeable cations Ca	Mg	Al	K	% Free Fe and Al: Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available P (ppm)
Ae	0–2	3.5	3.2	1.1	0.2	0.1	4.6	0.1	0.5	0.1	0.2	0.1	0.1	0.1	14.3
Bf1	2–15	4.4	4.3	2.9	0.1	0.0	0.8	0.1	2.3	1.2	1.3	1.7	0.8	0.4	9.8
Bf2	15–27	4.4	4.3	1.4	0.1	0.0	0.9	0.1	0.8	0.8	0.8	0.9	0.7	0.5	15.2
IIBm	27–39	4.2	4.0	0.3	0.1	0.0	1.9	0.1	1.2	1.2	0.3	0.2	0.2	0.2	8.9
IIBt	39–100	4.0	3.5	0.1	0.2	1.1	4.9	0.1	1.2	1.2	0.2	0.2	0.1	0.1	31.3

*At a tension of 50 cm of H_2O, the micropores retain their water while the macropores do not.

Harcourt Association

Soil unit: HT2
Location: lat. 46°33′0″ long. 65°18′32″
Parent material: coarse loamy ablation till over fine loamy lodgment till
Slope: 3%
Aspect: south
Elevation: 73 m AMSL
Drainage: well drained
Classification: Podzolic Gray Luvisol

Horizon	*Depth (cm)*	*Description*
LFH	8–0	pH 4.3; smooth, abrupt
Ae	0–5	7.5YR 6/2; sandy loam; moderate, fine subangular blocky; friable; wavy, abrupt; pH 4.6
Bf	5–36	7.5YR 5/6; sandy loam; strong, coarse granular; very friable; 2-5% gravel; wavy, abrupt; pH 5.0
Bfj	36–47	7.5YR 4/4; gravelly sandy loam; strong, medium granular; very friable; 20% gravel; smooth, abrupt; pH 4.8
IIBt	47–53	5YR 4/4, many 7.5YR 6/2 streaks; sandy clay loam; moderate, fine subangular blocky; firm; 5% gravel; few thin clay films; wavy, abrupt; pH 4.6
IIBt	53–80	5YR 4/3; clay loam; strong, coarse platy breaking into fine subangular blocky; very firm; 10% gravel; common moderate thick clay films on ped surface; smooth, gradual; pH 4.6
IIC	80–150	same as IIBt except pH 5.0, and a few thin clay films on ped surfaces

Soil unit HT2

Horizon	Depth cm	Mechanical analysis Sand fraction % 2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	% Pore space Macro	Micro	Total	% Moisture 10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	Hydraulic conductivity cm/hr
Bf	5–36						74.9	16.5	8.6	SL									
Bfj	36–47						55.6	27.8	16.6	SL									
IIBtg	47–53						58.4	25.0	26.6	SCL									
IIBt	53–80						38.0	27.0	35.0	CL									
IIC	80–150						40.2	27.0	32.8	CL									

Horizon	Depth cm	pH H_2O	pH $CaCl_2$	Org. C %	Exchangeable cations Ca	Mg	Al	K	% Free Fe and Al: Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available P (ppm)
Bf	5–36			1.5							0.2	0.6			
Bfj	36–47			0.4							0.2	0.4			
IIBtg	47–53			0.2							0.2	0.2			
IIBt	53–80			0.1							0.1	0.1			
IIC	80–150			0.1							0.1	0.0			

Harcourt Association

Soil unit: HT4
Location: lat. 46°54′47″ long. 65°38′16″
Parent material: ablation till over lodgment till
Slope: 1%
Aspect: south
Elevation: 32 m AMSL
Drainage: imperfect
Classification: Gleyed Podzolic Gray Luvisol

Horizon	*Depth (cm)*	*Description*
LFH	3–0	
Ae	0–7	7.5YR 7/2; sandy loam; weak, fine platy; friable to firm; wavy, abrupt; pH 4.3
Bfgj	7–23	7.5YR 5/6 with few fine prominent 2.5Y 5/4 mottles; clay loam; moderate, medium granular; friable; wavy, clear; pH 4.3
IIBg	23–38	10YR 5/4 with many medium prominent 5YR 4/4 and 10YR 5/6 mottles; silty clay loam; moderate, medium subangular blocky; firm; smooth, clear
IIBtgj	38–46	5YR 4/4 with common coarse distinct 5YR 6/4 mottles; sandy clay loam; weak, coarse subangular blocky; firm to very firm; common moderate, thick clay films; smooth, clear; pH 4.3
IIC	46+	5YR 4/4; clay loam to sandy clay loam; weak, fine subangular blocky; very firm; few moderate, thick, clay films; pH 4.3

Soil unit HT4

		Mechanical analysis Sand fraction %									Bulk	% Pore space			% Moisture				Hydraulic
Horizon	Depth cm	2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	density g/cm³	Macro	Micro	Total	10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	conductivity cm/hr
Bfgj	7–23						34.4	34.4	31.2	CL									
IIBtg	38–46						52.6	17.2	30.2	SCL									

									% Free Fe and Al						
	Depth	pH		Org. C	Exchangeable cations				Dithionate		Oxalate		Pyrophosphate		Available P
Horizon	cm	H_2O	$CaCl_2$	%	Ca	Mg	Al	K	Fe	Al	Fe	Al	Fe	Al	(ppm)
Bfgj	7–23			1.4									2.3	1.0	
IIBtg	38–46			0.1									0.1	0.1	

Harcourt Association

Soil unit: HT7
Location: lat. 46°34′25″ long. 65°40′36″
Parent material: coarse loamy ablation till over a fine loamy lodgment till
Slope: 2%
Aspect: southwest
Elevation: 97 m AMSL
Drainage: poor
Classification: Orthic Luvic Gleysol

Horizon	*Depth (cm)*	*Description*
L	trace	consists of deciduous leaves and coniferous needles
FH	2–0	5YR 2.5/2; mixture of partly decomposed leaves and humus; greasy; matted, yellow mycelia present
Aegj	0–10	7.5YR 6.5/2; sandy loam; many coarse, distinct 7.5YR 6/4 mottles; weak platy breaking down to large granular; friable; no coarse fragments; abrupt, wavy
Bgj	10–20	7.5YR 4.5/4; sandy loam; many medium, distinct, 7.5YR 5.5/6 mottles; weak platy breaking to coarse granular; friable; no coarse fragments; abrupt wavy
IIBtg	20–60	5YR 4.5/2; clay loam; many medium, prominent 7.5YR 5/8 mottles; very coarse blocky; very firm; clay skins present; few gravel

fragments of sandstone; abrupt, smooth (there are vertical streaks throughout this horizon; the streaks are very sandy, like sand flows, 1-2 cm wide and 7.5YR 6.5/2 in the center with thin layers of 7.5YR 5/8 on the outside)	IICg	60–100	7.5YR 4/4; clay loam; few medium, prominent 7.5YR 5/8 mottles; platy, firm; clay skins present, usually around roots and rocks; many black manganese specks; few subrounded or flat gravel fragments of sandstone

Note: 1. The IICg horizon usually has a 5YR hue.

Soil unit HT7

Horizon	Depth cm	Mechanical analysis Sand fraction % 2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	% Pore space Macro*	Micro*	Total	% Moisture 10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	Hydraulic conductivity cm/hr
Aeg	0–10	2.4	3.1	18.8	22.7	8.9	56.0	35.4	8.7	SL	1.4	9.8	36.4	46.2	28.0	26.0			0.1
Bg	10–20	2.1	3.7	18.5	23.0	9.0	56.2	29.5	14.4	SL	1.4	8.4	41.7	50.1	34.4	30.2			4.7
IIBtg	20–60	1.0	2.1	12.6	18.6	7.6	42.0	27.5	30.5	CL	1.7	5.3	32.2	37.4	19.2	18.4			0.0
IICg	60–100	1.2	2.4	13.6	19.2	7.4	43.8	28.0	28.2	CL	1.9	3.8	27.5	31.3	14.7	14.2			0.0

Horizon	Depth cm	pH H_2O	pH $CaCl_2$	Org. C %	Exchangeable cations Ca	Mg	Al	K	% Free Fe and Al Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available P (ppm)
Aeg	0–10	3.9	3.1	0.5	0.1	0.1	4.0	0.1	0.6	0.1	0.1	0.3	0.1	0.1	10.5
Bg	10–20	4.1	3.8	0.6	0.1	0.0	1.0	0.1	1.0	0.3	0.4	0.2	0.4	0.2	4.6
IIBtg	20–60	4.1	3.3	0.1	0.9	1.4	0.7	1.2	1.4	0.1	0.4	0.2	0.1	0.2	7.0
IICg	60–100	4.6	3.7	0.1					1.3	0.1	0.4	0.1	0.1	0.1	25.7

*At a tension of 50 cm of H_2O, the micropores retain their water while the macropores do not.

Harcourt Association

Soil unit: HT7
Location: lat. 46°46′22″ long. 65°10′7″
Parent material: coarse loamy ablation till over a fine loamy lodgment till
Slope: 0%
Aspect: N/A
Elevation: 47 m AMSL
Drainage: poor
Classification: Fera Luvic Gleysol

Horizon	*Depth (cm)*	*Description*
LFH	7–0	
Aeg	0–15	7.5YR 5/3 with many coarse, distinct 10YR 6/2 mottles; sandy loam; weak, fine platy; firm
Bgf	15–28	7.5YR 2/2; sandy loam; moderate, medium platy; friable to firm
Bg	28–38	5Y 6/1 with many coarse, prominent 7.5YR 4/4 mottles; silt loam; moderate, medium platy; firm
IICg	38+	5YR 4/3 with many coarse, prominent 5YR 5/6 mottles; sandy clay loam to clay loam; moderate, coarse subangular blocky; very firm; streaks of sand skeletons along ped surface

Note: 1. No analytical information available.

Kouchibouguac Association

Soil unit:	KO2
Location:	lat. 46°43′35″ long. 64°59′10″
Parent material:	glacial outwash sand
Slope:	5%
Aspect:	west
Elevation:	11 m AMSL
Drainage:	well drained
Classification:	Ortstein Humo-Ferric Podzol

Horizon	*Depth (cm)*	*Description*
Ap	0–18	7.5YR 4/2; loamy sand; weak, fine, granular; very friable; abrupt, wavy; pH 4.8
Ae	18–25	7.5YR 6/2; loamy sand; weak, fine, subangular blocky; very friable; abrupt, broken; pH 4.8
Bfc	25–35	5YR 4.5/8; loamy sand; massive; very firm; strongly cemented, discontinuous ortstein; abrupt, irregular; pH 4.8
Bfjc	35–50	7.5YR 4.5/6; loamy sand; massive; very firm; strongly cemented, discontinuous ortstein; abrupt, wavy; pH 4.8
C	50+	10YR 4.5/4; loamy sand; single grain; loose; pH 5.3

Note: 1. No analytical information available.

Kouchibouguac Association

Soil unit:	KO2
Location:	lat. 46°45′ long. 65°11′
Parent material:	glacial drift
Slope:	2-3%
Aspect:	northeast
Elevation:	50 m AMSL
Drainage:	well drained
Classification:	Eluviated Dystric Brunisol

Horizon	*Depth (cm)*	*Description*
Ae	0–8	10YR 6/2; loamy sand; weak coarse subangular blocky; very friable; extremely acid; abrupt wavy boundary
Bfl	8–12	5YR 4/5; loamy sand to sandy loam; moderate medium granular; very friable; 5-10% gravel, mostly flat sandstone; strongly acid; abrupt wavy boundary (about 10% of the horizon is 5YR 3/3, cemented, firm, very hard, and brittle)
Bfjgjc	12–34	8.5YR 5/6 (10YR 7/4 dry) a few distinct medium 7.5YR 3/3 (7.5YR 5/4 dry) mottles; loamy sand; massive in situ breaks into strong coarse subangular blocky; very firm, very hard, and strongly cemented; 10% coarse fragments, mostly flat sandstones; strongly acid; gradual wavy boundary
BC	34–60	2.5Y 5/4; sand to loamy sand; massive; friable to firm, appears to have very weak cementation; 5% sandstone coarse fragments; strongly acid; abrupt wavy boundary
C	60–96	2.5Y 4/4; sand to gravelly sand; massive, firm and hard in situ, appear to be very weakly cemented, compact; 15% coarse fragments, mostly flat sandstones; strongly acid; abrupt smooth boundary
IIC	96–146	gravelly sandy loam with occasional sand pockets; 9YR 4/3 with common 7.5YR 5/4 silt plus clay coatings along the pore and ped surfaces; moderate medium subangular blocky; firm, hard and compact; 30% coarse fragments mostly subangular sandstones; abrupt smooth boundary
R	146+	Pennsylvanian gray sandstone

Soil unit KO2

Horizon	Depth cm	Mechanical analysis Sand fraction % 2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	% Pore space Macro	Micro	Total	% Moisture 10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	Hydraulic conductivity cm/hr
Ae	0–8						81.7	14.9	3.4		1.3								33
Bf1	8–12						81.0	7.6	11.4		1.2								47
Bfjgjc	12–34						86.0	5.6	8.4		1.5								10
BC	34–60						94.1	2.6	3.3		—								—
C	60–96						91.0	5.7	3.3		1.6								45
IIC	96–146						71.0	21.2	7.8		—								4

Horizon	Depth cm	pH H_2O	pH $CaCl_2$	Org. C %	Exchangeable cations Ca	Mg	Al	K	% Free Fe and Al Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available P (ppm)
Ae	0–8		3.5	0.3	0.3	0.2	1.5	0.1	0.1		0.0	0.0	0.0	0.0	
Bf1	8–12		4.7	1.2	0.2	0.0	0.2	0.1	1.1		0.6	1.4	0.2	0.5	
Bfjgjc	12–34		5.2	0.3	0.2	0.1	0.1	0.1	0.8		0.4	1.1	0.1	0.3	
BC	34–60		4.8	0.0	0.2	0.0	0.1	0.1	0.2		0.1	0.2	0.1	0.1	
C	60–96		4.6	0.0	0.1	0.0	0.2	0.1	0.3		0.1	0.2	0.1	0.1	
IIC	96–146		4.0	0.1	0.2	0.1	1.3	0.1	0.6		0.2	0.2	0.0	0.1	

Kouchibouguac Association

Soil unit: KO7
Location: lat. 46°45′ long. 65°11′
Parent material: glacial drift
Slope: level
Aspect: N/A
Elevation: 50 m AMSL
Drainage: poor
Classification: Ortstein Humic Podzol

Horizon	*Depth (cm)*	*Description*
Aeg	0–15	10YR 7/2 (10YR 8/1 dry) with many faint coarse 10YR 6/3 (10YR 7/2 dry) mottles; sand to loamy sand; very weak medium subangular blocky; very friable; extremely acid; abrupt wavy boundary
Bhcg	15–21	2.5YR 2/4 with many distinct coarse 5YR 3/2 mottles; loamy sand to sandy loam; coarse moderate platy in situ breaking into strong coarse subangular blocky; very firm, extremely hard and strongly cemented; strongly acid; clear wavy boundary (there are 2.5YR 2/1 organic matter coatings in the upper surface of the horizontal ped surface and a thin organic coating of 2.5YR 2/2 on the underside of peds)
Bfcg	21–60	5YR 3/3 with common distinct coarse 5YR 4/6 and 10YR 5/4 mottles; loamy sand to sandy loam; massive in situ and breaking into coarse subangular blocky; very firm, extremely hard, and strongly cemented; about 10% platy gray sandstone, most of the stones are found in the lower part of the horizon; strongly acid; abrupt wavy boundary
Bfgcj	60–76	7.5YR 3/2 with many distinct large 10YR 4/3 mottles; loamy sand; massive in situ and breaking into medium and coarse subangular blocky; firm to very hard; 10% platy sandstone; strongly acid; abrupt wavy boundary
Cgj	76–98	2.5Y 4/4 with a few 10YR 4/2 mottles; loamy sand; massive; firm, hard, and compact; 10-15% platy sandstone; strongly acid; abrupt wavy boundary
R	98+	Pennsylvanian gray sandstone, easily split near the surface of the R layer but becoming harder below

Note: 1. No roots grow below Aeg horizon in the poorly drained trench.

Soil unit KO7

Horizon	Depth cm	Mechanical analysis Sand fraction % 2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	% Pore space Macro	Micro	Total	% Moisture 10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	Hydraulic conductivity cm/hr
Aeg	0–15						83.3	13.0	3.7		1.5								12
Bhcg	15–21						84.2	7.4	8.3		1.5								8
Bfcg	21–60						89.9	3.1	7.0		1.5								3
Bfgcj	60–76						92.8	3.6	3.6		1.6								31
Cgj	76–98						92.4	4.4	3.2		1.6								8

Horizon	Depth cm	pH H_2O	pH $CaCl_2$	Org. C %	Exchangeable cations Ca	Mg	Al	K	% Free Fe and Al Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available P (ppm)
Aeg	0–15		3.2	0.3	0.2	0.1	1.8	0.1	0.0		0.0	0.0	0.0	0.0	
Bhcg	15–21		3.6	4.0	0.2	0.1	4.6	0.1	0.5		0.3	1.0	0.2	0.8	
Bfcg	21–60		4.3	1.8	0.2	0.1	1.0	0.1	0.7		0.5	1.0	0.3	0.4	
Bfgcj	60–76		4.1	1.0	0.2	0.1	1.0	0.1							
Cgj	76–98		4.2	0.6	0.2	0.1	0.6	0.1	0.4		0.2	0.2	0.2	0.2	

Lord and Foy Association

Soil unit: LF1
Location: lat. 46°39′48″ long. 65°40′05″
Parent material: cobbly sandy outwash
Slope: 5%
Aspect: south
Elevation: 100 m AMSL
Drainage: excessive
Classification: Orthic Humo-Ferric Podzol

Horizon	*Depth (cm)*	*Description*
LFH	7–0	consists mostly of F with very little L and H; mainly semidecomposed mosses, branches, roots, and needles; evidence of fire
Ae	0–18	10YR 6/3; fine sand; weak, fine subangular blocky; very friable; 35% rounded and subrounded, mainly cobble sized but some stone and gravel sized sandstone fragments; abrupt, irregular
Bf	18–53	7.5YR 5/8; fine loamy sand; moderate; fine and medium, granular; very friable; 50% rounded and subrounded, mostly cobble and stone sized but a few gravel sized sandstone fragments; abrupt, irregular
C	53+	1.5Y 4.5/4; gravelly fine sand; single grain; loose; 80% rounded and subrounded cobble and stone sized and some gravel sized sandstone fragments

Soil unit LF1

Horizon	Depth cm	Mechanical analysis Sand fraction % 2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	% Pore space Macro	Micro	Total	% Moisture 10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	Hydraulic conductivity cm/hr
Bf	18–53	11.7	21.9	14.9	21.2	5.0	74.6	15.7	9.7										
C	53	27.5	30.4	18.3	8.3	2.4	86.9	8.5	4.6										

Horizon	Depth cm	pH		Org. C %	Exchangeable cations				% Free Fe and Al						Available P (ppm)
		H_2O	$CaCl_2$		Ca	Mg	Al	K	Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	
Bf	18–53	5.0	4.5	1.3									0.4	0.5	
C	53	4.9	4.5	0.3									0.1	0.2	

Mount Hope Association

Soil unit: MH2
Location: lat. 46°35′05″ long. 64°47′52″
Parent material: reworked marine or lacustrine clay
Slope: 4%
Aspect: south
Elevation: 18 m AMSL
Drainage: moderately well drained
Classification: Podzolic Gray Luvisol

Horizon	*Depth (cm)*	*Description*
Ap	0–25	7.5YR 4/4; loam; moderate, medium granular; friable; abrupt, smooth
Bf	25–33	5YR 5/4; loam; moderate to strong, medium, granular; friable; abrupt, wavy
Ae	33–45	5YR 4/4; silt loam; weak, medium, subangular blocky; firm; clear, smooth
Bt	45–102	5YR 4/3; silty clay; moderate coarse platy and moderate medium blocky; thin clay films along ped surface; very firm; clear, smooth
IIC	102+	5YR 3.5/3; loam; massive; very firm; 25% angular cobble and stone sized and rounded and subrounded gravel sized sandstone coarse fragments

Note: 1. The first material (I) has less than 2% coarse fragments (sandstone).
2. The second material (II) has more coarse fragments and is lighter textured than usual for this material.

Soil unit MH2

Horizon	Depth cm	Mechanical analysis Sand fraction % 2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	% Pore space Macro*	Micro*	Total	% Moisture 10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	Hydraulic conductivity cm/hr
Ap	0–25	0.2	3.0	7.3	11.9	10.0	32.4	42.7	24.9	L	1.0	24.2	38.6	62.8	54.0	39.1		9.9	30.0
Bf	25–33	0.2	2.3	5.9	11.3	12.2	31.9	42.1	26.0	L									
Ae	33–45	0.1	1.1	3.1	7.4	14.3	26.0	50.0	24.1	SiL									
Bt	45–102	0.1	0.8	1.7	4.3	12.2	19.0	40.4	40.6	SiC	1.8	5.4	36.1	41.5	21.2	20.3		13.2	0.1
IIC	102	0.2	3.0	8.6	19.0	10.1	40.8	33.5	25.7	L									

Horizon	Depth cm	pH		Org. C %	Exchangeable cations				% Free Fe and Al						Available P (ppm)
		H_2O	$CaCl_2$		Ca	Mg	Al	K	Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	
Ap	0–25	4.2	4.0	1.8	1.5	1.0	2.4	0.2	1.6	0.3	0.5	0.3	0.7	0.4	9.3
Bf	25–33	4.3	4.0	1.3	0.5	0.2	1.9	0.2	1.9	0.4	0.6	0.4	1.0	0.6	6.4
Ae	33–45	4.3	3.9	0.4	0.4	0.3	2.7	0.1	1.4	0.2	0.2	0.2	0.5	0.5	3.4
Bt	45–102	4.0	3.5	0.2	1.6	2.0	4.5	0.2	1.9	0.2	0.3	0.2	0.6	0.0	27.2
IIC	102	4.8	4.4	0.0	3.8	2.1	0.1	0.1	1.6	0.1	0.1	0.1	0.3	0.4	203.5

*At a tension of 50 cm of H_2O, the micropores retain their water while the macropores do not.

Mount Hope Association

Soil unit: MH4
Location: lat. 46°48′0″ long. 65°0′34″
Parent material: reworked marine or lacustrine clay
Slope: 1%
Aspect: east
Elevation: 14 m AMSL
Drainage: imperfect
Classification: Gleyed Podzolic Gray Luvisol

Horizon	*Depth (cm)*	*Description*
Ap	0–15	10YR 3/3; silt loam; moderate, coarse granular; friable; smooth, abrupt
Ae	15–17	7.5YR 6/3; silt loam; weak, fine platy; friable; broken, abrupt
Bfgj	17–45	5YR 5/4 with common medium, distinct 5YR 5/6 mottles; silty clay loam; strong, fine subangular blocky; firm; smooth, clear
Btgj	45–120	5YR 4/3 with few medium faint 5YR 5/4 mottles; silty clay; strong, medium subangular blocky; very firm; many thick clay films on ped surface; smooth, clear
C	120–180	5YR 4/3; silty clay; moderate, medium platy; very firm; few moderate thick clay films on ped surface

Note: No analytical data available.

Mount Hope Association

Soil unit: MH7
Location: lat. 46°57′45″ long. 65°19′05″
Parent material: reworked marine or lacustrine clay
Slope: 1%
Aspect: west
Elevation: 23 m AMSL
Drainage: poor
Classification: Orthic Luvic Gleysol

Horizon	*Depth (cm)*	*Description*
LF	6–2	7.5YR 3/2; consists of semidecomposed roots, branches, bark, hardwood leaves, conifer needles, and sphagnum moss; pH 3.8
H	2–0	7.5YR 2/0; greasy; consists of completely decomposed organic matter; pH 4.1
Ahegj	0–2.5	10YR 4.5/2; fine sandy silt loam; moderate to strong, fine and medium, granular; friable; abrupt, wavy; pH 4.3
Aeg	2.5–7.0	10YR 6/2; sandy loam; many fine, prominent 10YR 6/6 and common coarse, faint 10YR 5/2 mottles, weak to moderate, fine platy; friable to very friable; clear, wavy; pH 4.4
Bm	7–19	7.5YR 5/8 inside ped with 5YR 5/3 ped surfaces; clay loam; strong, fine and medium, subangular blocky; friable to firm, sticky, and plastic to very plastic; common very thin, clay films on ped surfaces and in root channels; clear, wavy; pH 4.4
Btgj	19–39	5YR 4/4 ped interior with 5YR 5/3 ped surfaces; clay loam; many coarse and medium, distinct 5YR 4/6 mottles; strong, medium and coarse, granular and subangular blocky; very firm in situ, firm on excavation; sticky and plastic to very plastic; many to common thin to very thin, clay films on ped surfaces and in root channels and on pore walls; gradual, wavy; pH 4.8
Bt2	39–60	5YR 3/3; clay loam; strong, coarse, subangular blocky; very firm in situ, firm on excavation; sticky and plastic to very plastic; few very thin manganese specks on ped surfaces; many thin to moderately thick clay films on ped surfaces and in root channels and on pore walls; gradual, wavy; pH 5.0
C	60+	5YR 3/3; clay loam; strong, fine, subangular blocky; firm; sticky and plastic to very plastic; many thin to very thin clay films on ped surfaces and in voids; few very thin manganese specks on ped surfaces; pH 5.3

Note:
1. Calcareous (only slightly) at 120-130 cm.
2. There are very few coarse fragments, 5% for the whole profile, ranging from gravel to cobbles to stones with the majority being gravel or cobbles, mostly subrounded or subangular and dominantly sandstone. There are many fragments of foreign material (granitic, metamorphic—gneiss, schist, slate, and argillite; and some volcanic). These coarse fragments are scattered at random throughout the profile.
3. No analytical information available.

Reece Association

Soil unit: RE2
Location: lat. 46°42'16" long. 65°27'38"
Parent material: coarse loamy ablation till over fine loamy lodgment till
Slope: 1%
Aspect: north
Elevation: 90 m AMSL
Drainage: well drained
Classification: Humo-Ferric Podzol

Horizon	*Depth (cm)*	*Description*
Ap	0–17	10YR 4/4; sandy loam; moderate subangular blocky breaking down to granular; very friable; few subangular gravel fragments of sandstone; smooth, clear (The Ap is intermixed with the Bf and small patches of Ae)
Ae	17–20	10YR 7/1; sandy loam; medium granular; loose; very few coarse fragments; clear, broken (this horizon has discontinuous tongues extending to 27 cm)
Bf	17–30	7.5YR 5/6; sandy loam; subangular blocky breaking down to granular; friable; very few coarse fragments; clear, wavy
BCxj	30–54	10YR 5/3; sandy loam; platy in situ breaking down to coarse subangular blocky; slightly firm; few coarse fragments; diffuse, wavy
IIC	54 +	10YR 4/4; sandy clay loam; strong platy; firm to very firm; many small gravel and a few cobble fragments of sandstone

Soil unit RE2

Horizon	Depth cm	Mechanical analysis Sand fraction % 2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	% Pore space Macro*	Micro*	Total	% Moisture 10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	Hydraulic conductivity cm/hr
Ap	0–17	3.6	6.3	23.5	22.4	7.3	63.1	24.8	12.1	SL	1.4	18.3	27.9	46.2	27.5	20.1		5.9	17.3
Ae	17–20	3.3	6.4	25.8	24.0	8.7	68.2	27.6	4.2	SL	1.1	15.7	40.9	56.7	47.8	37.2		9.2	5.1
Bf	20–30	3.5	5.6	17.8	18.1	11.4	56.4	35.1	8.5	SL									
BCxj	30–54	3.8	5.2	18.7	17.5	7.5	52.8	33.8	13.4	SL	1.4	10.2	32.2	42.4	28.4	23.1		3.8	4.3
IIC	54	3.0	4.9	19.4	17.5	5.7	50.5	25.7	23.8	SCL	1.8	7.2	24.3	31.5	15.6	13.6		8.3	0.3

Horizon	Depth cm	pH H_2O	pH $CaCl_2$	Org. C %	Exchangeable cations Ca	Mg	Al	K	% Free Fe and Al Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available P (ppm)
Ap	0–17	4.4	4.0	1.3	0.2	0.1	0.6	0.2	1.1	0.7	0.5	0.5	0.2	0.1	6.5
Ae	17–20	4.0	3.6	0.6	0.4	0.1	1.6	0.1	0.2	0.1	0.1	0.0	0.1	0.0	5.8
Bf	20–30	4.5	4.4	2.0	0.2	0.0	0.3	0.1	1.8	1.0	1.0	1.7	0.3	0.4	1.4
BCxj	30–54	4.4	3.9	0.2	0.2	0.0	0.8	0.1	0.8	0.1	0.2	0.2	0.1	0.1	2.4
IIC	54	4.1	3.5	0.1	0.2	0.5	2.8	0.1	1.3	0.1	0.3	0.2	0.1	0.1	9.2

*At a tension of 50 cm of H_2O, the micropores retain their water while the macropores do not.

Reece Association

Soil unit:	RE2
Location:	lat. 46°55′53″ long. 65°44′24″
Parent material:	fine loamy lodgment till (possibly some coarse loamy ablation till over the fine loamy lodgment till)
Slope:	1%
Aspect:	north
Elevation:	76 m AMSL
Drainage:	moderately well drained
Classification:	Orthic Humo-Ferric Podzol

Horizon	*Depth (cm)*	*Description*
L	4–3	hardwood leaves with some conifer needles
F	3–1	semidecomposed hardwood leaves and roots and mosses
H	1–0	7.5YR 2/0; greasy
Ae	0–3.5	10YR 6/2.5; sandy loam; moderate, medium, subangular blocky; friable; less than 5% coarse fragments—fine gravel and cobbles of sandstone with some foreign material; abrupt, wavy to irregular; pH 4.8
Bf	3.5–12	7.5YR 5/8; loam; moderate, medium and coarse, subangular blocky; very friable; less than 5% coarse fragments—gravel and cobbles of sandstone with some foreign material; clear, wavy; pH 5.0
Bfj	12–22	10YR 4/5; sandy loam to loam; weak, coarse, granular; very friable; 5% coarse fragments—gravel and cobbles of sandstone with some foreign material; clear, wavy; pH 5.2
BCgj	22–39	10YR 5/3.5; sandy loam to loam; few fine prominent 5YR 5/8 mottles; moderate, fine and medium, subangular blocky; friable; coarse fragments—gravel and cobbles of sandstone with some foreign material; abrupt, wavy; pH 5.0
IIC1	39–61	7.5YR 4/4; sandy clay loam; few medium, faint 7.5YR 4.5/5 mottles; massive in situ, moderate, medium and coarse subangular blocky on excavation; firm; common, very thin clay films on ped surface; 15% coarse fragments—10% fine gravel of foreign material and 5% stones of sandstone; gradual, smooth; pH 4.8 (some feldspar and possibly some fragipan in this horizon)
IIC2	61+	6YR 3.5/3; sandy clay loam; few medium distinct 5YR 4/5 mottles; massive in situ, strong, coarse, platy on excavation; firm to very firm; few very thin clay films on rock surfaces; 30% coarse fragments—5% fine gravel of foreign material and 25% stones of sandstone; pH 4.8 (some feldspar present)

Note: 1. Foreign material refers to coarse fragments of granitic, metamorphic, and volcanic rock, i.e., nonsandstone.
2. This profile shows some tendencies of intergrading toward the Rogersville association.
3. No analytical data available.

Reece Association

Soil unit:	RE4
Location:	lat. 46°47′29″ long. 65°28′04″
Parent material:	fine loamy lodgment till with a thin surficial deposit of coarse loamy ablation till
Slope:	0%
Aspect:	N/A
Elevation:	45 m AMSL
Drainage:	imperfect
Classification:	Gleyed Eluviated Dystric Brunisol

Horizon	*Depth (cm)*	*Description*
L	trace	consists of deciduous leaves and coniferous needles
FH	2–0	5YR 3/2; consists of a mixture of humus and partly decomposed leaves and needles; very greasy; matted

Ae	0–5	7.5YR 6/2; sandy loam; strong coarse granular breaking down to medium granular; friable; very few coarse fragments; abrupt, wavy (pockets of Ae extend to 12 cm; faint streaks of mottling (7.5YR 5/8) surround root channels)
Bfjgj	5–18	7.5YR 4.5/6; sandy loam; many coarse, distinct 7.5YR 5.5/8 mottles; medium weak granular; friable; few angular and subangular gravel fragments of sandstone with a few metamorphic fragments; abrupt, wavy
Cxgj	18–34	10YR 5/8; sandy loam to loam; many medium to coarse, distinct 7.5YR 5/8 mottles; strong, coarse, blocky; firm; many small angular gravel fragments of sandstone; abrupt, broken (vertical streaks of 10YR 6.5/2)
IICg	34–42	10YR 4/4; sandy clay loam; many medium to coarse, prominent 7.5YR 5/8 mottles; strong platy breaking to strong coarse granular; firm; few flat and angular gravel fragments of sandstone; diffuse, wavy (vertical streaks of 10YR 6.5/2 throughout horizon)
IIC	42–100	10YR 4/4; sandy clay loam; strong, platy; firm; few clay skins; few specks of manganese; few red and brown specks of weathered shale; many coarse angular fragments of sandstone

Note: 1. In this profile the fragipan is closer to the soil surface than usual for soils of this unit.

Soil unit RE4

Horizon	Depth cm	Mechanical analysis Sand fraction % 2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	% Pore space Macro*	Micro*	Total	% Moisture 10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	Hydraulic conductivity cm/hr
Ae	0–5	2.3	3.9	17.6	25.4	10.4	59.6	33.5	6.9	SL	1.2	19.6	38.8	58.4	45.5	35.2		6.9	
Bfjgj	5–18	4.6	5.7	18.9	25.7	9.4	64.3	26.1	9.6	SL									
IICg	18–42	1.5	2.9	15.0	24.9	10.9	55.1	23.2	21.7	SCL									
IIC	42–100	2.2	3.4	15.8	21.6	7.9	50.8	27.5	21.7	SCL	1.9	3.9	31.0	34.9	18.1	16.8		8.0	0.1

Horizon	Depth cm	pH H_2O	pH $CaCl_2$	Org. C %	Exchangeable cations Ca	Mg	Al	K	% Free Fe and Al Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available P (ppm)
Ae	0–5	4.0	3.2	0.8	0.4	0.1	3.6	0.1	0.3	0.1	0.1	0.1	0.1	0.1	2.6
Bfjgj	5–18	4.5	4.3	1.2	0.1	0.0	0.3	0.1	1.1	0.7	0.6	1.3	0.1	0.3	0.7
IICg	34–42	4.4	3.6	0.2	0.2	0.1	2.0	0.1	1.0	0.1	0.4	0.1	0.2	0.2	2.7
IIC	42–100	4.9	4.2	0.2	4.4	2.9	0.2	0.1	1.4	0.1	0.4	0.2	0.1	0.1	21.4

*At a tension of 50 cm of H_2O, the micropores retain their water while the macropores do not.

Reece Association

Soil unit: RE7
Location: lat. 46°44′33″ long. 65°23′28″
Parent material: fine loamy lodgment till
Slope: 1%
Aspect: east
Elevation: 78 m AMSL
Drainage: poor
Classification: Gleyed fragic Ferro-Humic Podzol

Horizon	*Depth (cm)*	*Description*
LFH	7–0	not described
Aegj	0–7	10YR 7/2 with few coarse distinct 10YR 5/3 mottles; sandy loam; moderate, fine, subangular blocky; friable to firm; wavy, abrupt; pH 4.3
Bhfgj	7–16	5YR 4/7 with many fine, prominent 7.5YR 4/4 mottles; sandy clay loam; strong, fine, subangular blocky; friable to firm; wavy, abrupt; pH 4.8
BCxg	16–55	2.5Y 4/4 with many coarse, prominent 7.5YR 5/4 mottles; sandy loam; strong, medium subangular blocky; very firm and brittle; smooth, gradual; pH 5.0
Cg	55+	7.5YR 3/4 with many fine prominent 5Y 6/2 and many coarse, distinct 7.5YR 5/6 mottles; sandy clay loam; moderate, coarse, subangular blocky; very firm; pH 5.0

Soil unit RE7

		Mechanical analysis Sand fraction %									Bulk	% Pore space			% Moisture				Hydraulic
Horizon	Depth cm	2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	density g/cm³	Macro	Micro	Total	10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	conductivity cm/hr
Bhfgj	7–16						48.4	27.6	24.0	SCL									
BCgx	16–55						64.4	17.0	18.6	SL									
Cg	55						54.2	20.2	25.6	SCL									

									% Free Fe and Al						
	Depth	pH		Org. C	Exchangeable cations				Dithionate		Oxalate		Pyrophosphate		Available P
Horizon	cm	H_2O	$CaCl_2$	%	Ca	Mg	Al	K	Fe	Al	Fe	Al	Fe	Al	(ppm)
Bhfgj	7–16			5.4							—	—			
BCgx	16–55			1.9							0.3	0.4			
Cg	55			0.2							0.1	0.1			

Richibucto Association

Soil unit: RB2
Location: lat. 46°30′48″ long. 64°43′02″
Parent material: marine-influenced outwash sand
Slope: less than 1%
Aspect: south
Elevation: 5 m AMSL
Drainage: well drained
Classification: Orthic Humo-Ferric Podzol

Horizon	*Depth (cm)*	*Description*
Ap	0–26	10YR 4/4; loamy sand; weak, fine granular; very friable; abrupt, smooth
Bf	26–36	7.5YR 5/6; loamy sand; weak, fine granular; very friable; 5% by volume of this horizon is slightly cemented; clear, smooth
BC	36–50	7.5YR 4/4; sand; single grain; loose; gradual, smooth
C	50+	7.5YR 4/3; sand; single grain; loose

Note: 1. Roots down to 70 cm.
2. Very strongly acid throughout the profile.

Soil unit RB2

Horizon	Depth cm	Mechanical analysis Sand fraction % 2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	% Pore space Macro	Micro	Total	% Moisture 10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	Hydraulic conductivity cm/hr
Bf	26–36	0.4	20.2	34.7	15.5	2.8	73.5	9.5	17.0										
C	50	0.2	18.1	42.6	24.6	4.0	89.6	6.0	4.4										

Horizon	Depth cm	pH H_2O	pH $CaCl_2$	Org. C %	Exchangeable cations Ca	Mg	Al	K	% Free Fe and Al: Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available P (ppm)
Bf	26–36	5.3	4.6	2.9									0.7	0.9	
C	50+	5.5	4.8	0.1									0.1	0.1	

Richibucto Association

Soil unit: RB2
Location: lat. 46°38′36″ long. 65°02′20″
Parent material: sandy glacial outwash
Slope: 3%
Aspect: north
Elevation: 14 m AMSL
Drainage: well drained
Classification: Eluviated Dystric Brunisol

Horizon	*Depth (cm)*	*Description*
Ap	0–12	10YR 3.5/3; sandy loam; weak, fine, subangular blocky; very friable; abrupt, smooth
Bm	12–35	7.5YR 5/6; loamy sand; weak, fine, subangular blocky; very friable; abrupt, wavy
BC	35–99	10YR 4/4; loamy sand; single grain; loose; clear, smooth
C	99+	2.5Y 4/3; sand; massive and single grain; friable

Soil unit RB2

Horizon	Depth cm	Mechanical analysis Sand fraction % 2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	% Pore space Macro*	Micro*	Total	% Moisture 10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	Hydraulic conductivity cm/hr
Ap	0–12	0.6	6.4	24.9	35.1	7.5	74.4	15.7	9.9	SL	1.2	20.3	32.6	52.8	38.4	27.2		7.8	35.0
Bm	12–35	1.4	9.7	26.3	35.9	10.8	84.0	10.7	5.4	LS									
BC	35–99	2.1	12.0	35.4	30.9	5.0	85.4	11.4	3.2	LS									
C	99	0.9	7.9	20.4	50.5	7.0	86.8	10.0	3.2	S	1.5	12.2	27.6	39.8	25.2	18.7		1.9	30.0

Horizon	Depth cm	pH H_2O	pH $CaCl_2$	Org. C %	Exchangeable cations Ca	Mg	Al	K	% Free Fe and Al: Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available P (ppm)
Ap	0–12	4.9	4.4	1.9	1.2	0.2	0.1	0.1	1.0	0.4	0.5	0.4	0.3	0.2	6.4
Bm	12–35	4.7	4.4	1.0	0.2	0.0	0.2	0.1	1.0	0.7	0.4	0.8	0.1	0.2	3.7
BC	35–99	4.4		0.2	0.1	0.0	0.2	0.1	0.4	0.2	0.1	0.3	0.1	0.1	6.6
C	99	4.3	4.1	0.1	0.1	0.0	0.3	0.0	0.4	0.1	0.1	0.2	0.1	0.1	14.6

*At a tension of 50 cm of H_2O, the micropores retain their water while the macropores do not.

Richibucto Association

Soil unit:	RB2
Location:	lat. 46°36′42″ long. 64°44′17″
Parent material:	fine marine sand
Slope:	2%
Aspect:	southeast
Elevation:	8 m AMSL
Drainage:	well drained
Classification:	Orthic Humo-Ferric Podzol

Horizon	*Depth (cm)*	*Description*
Ap	0–14	7.5YR 4/2; sandy loam; strong, medium granular; very friable; smooth, abrupt
Ae	trace	5YR 6/2; loamy sand; weak, medium, subangular blocky; friable; irregular, abrupt; 0-20 cm thick
Bf	14–30	5YR 5/8; sandy loam; moderate, medium granular; very friable; irregular, abrupt
Bfc	20–30	7.5YR 4/4 with many prominent 5YR 4/8 specks; loamy sand to sandy loam; massive; very firm and brittle; wavy, abrupt
BCcj	30–48	10YR 4/4; loamy sand; massive; firm; smooth, clear
C	48+	10YR 4/3; fine, loamy sand to sand; single grain; loose

Note: 1. The whole profile is acid.
2. The Bfc horizon is not continuous, occupying less than 30% of Bf horizon.
3. No analytical information available.

Riverbank Association

Soil unit:	R4
Location:	lat. 46°57′10″ long. 65°40′53″
Parent material:	water-deposited sand
Slope:	5%
Aspect:	east
Elevation:	25 m AMSL
Drainage:	imperfect
Classification:	Gleyed Eluviated Dystric Brunisol

Horizon	*Depth (cm)*	*Description*
Ap	0–25	10YR 3/3.5; sandy loam; weak, fine, and medium granular; very friable; abrupt, smooth
Bfjgj	25–37	9YR 5/8; loamy sand; common fine, prominent 10YR 3/3 vertical streaks, a few fine, prominent 10YR 3/3 blotches and a few medium, faint 10YR 5/7 mottles; structureless in situ breaking into single grains and a few coarse, granular on excavation; very friable; clear, wavy
BCgj	37–56	10YR 5/6; sand; few medium, faint 7.5YR 5/6 mottles; structureless in situ breaking into single grains and a few weak, coarse and medium granular on excavation; very friable; diffuse, wavy
CB	56–80	10YR 5.5/5; sand; common medium, faint 10YR 5/6 mottles; structureless in situ breaking into single grains and a few coarse granular on excavation; very friable to loose; gradual, wavy
Cgj	80+	10YR 5.5/3.5; loamy sand; few medium, distinct 10YR 3/2 bands (of fine sand), common fine to medium, distinct 10YR 5/6 and few fine, distinct 7.5YR 5/8 mottles; structureless in situ breaking into single grains and some weak, medium subangular blocky on excavation; friable in situ breaking into very friable on excavation

Note: 1. In the profile adjacent to the one described above there was a weak discontinuous ortstein layer in the Bf horizon (also a Bhfcj horizon).
2. The sand found in this profile is composed of quartz, hornblende, biotite, and various feldspars.
3. Bedding is obvious in the C horizon.

Soil unit R4

Horizon	Depth cm	Mechanical analysis Sand fraction % 2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	% Pore space Macro	Micro	Total	% Moisture 10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	Hydraulic conductivity cm/hr
Ap	0–25	2.3	18.8	32.1	13.8	5.5	72.5	19.2	8.3	SL	1.1	33.5	23.3	56.9	50.2	33.9	21.4	6.8	34.4
Bfjgj	25–37	2.1	19.5	34.8	13.9	6.2	76.4	21.2	2.4	LS									
BCgj	37–56	1.1	13.0	36.1	30.5	8.3	89.1	9.3	1.6	S									
CB	56–80	0.3	3.3	40.2	38.5	8.2	90.6	7.5	1.9	S									
Cgj	80	0.2	3.5	33.1	29.9	14.4	81.1	16.8	2.1	LS	1.6	28.1	10.0	38.1	23.4	15.7	6.3	1.2	7.2

Horizon	Depth cm	pH H_2O	pH $CaCl_2$	Org. C %	Exchangeable cations Ca	Mg	Al	K	% Free Fe and Al Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available P (ppm)
Ap	0–25	5.7	5.1	2.8	2.0	0.3	0.1	0.1	0.8	0.5	0.3	0.6	0.1	0.3	19.1
Bfjgj	25–37	6.0	5.4	0.7	1.1	0.1	0.1	0.1	1.0	0.5	0.4	1.0	0.1	0.2	4.2
BCgj	37–56	5.9	5.3	0.2	0.4	0.0	0.0	0.1	0.4	0.2	0.1	0.3	0.0	0.1	3.7
CB	56–80	5.4	5.2	0.0	0.3	0.0	0.0	0.1	0.3	0.1	0.1	0.2	0.0	0.1	17.0
Cgj	80	5.5	5.2	0.1	0.4	0.0	0.0	0.1	0.4	0.1	0.1	0.2	0.0	0.1	20.9

*At a tension of 50 cm of H_2O, the micropores retain their water while the macropores do not.

Rogersville Association

Soil unit: RS2
Location: lat. 46°45′55″ long. 65°44′34″
Parent material: fine loamy lodgment till with granitic, metamorphic, and some volcanic coarse fragments
Slope: 1%
Aspect: north
Elevation: 57 m AMSL
Drainage: moderately well drained
Classification: Fragic Humo-Ferric Podzol

Horizon	*Depth (cm)*	*Description*
L	4–3	consists of dead ferns, shrubs, grasses, and some coniferous needles
FH	3–0	black; slightly greasy; bits of plant material and dead roots not completely decomposed; pH 4.3
Ae	0–10	10YR 6/2; sandy loam; weak to moderate, medium, granular; very friable; 10-15% coarse fragments, subangular, gravel and a few cobbles of foreign material (see note 1); abrupt, wavy
Bhf	10–13	5YR 4/6; sandy loam; weak to moderate, fine, granular; very friable; 10% coarse fragments, subangular and subrounded, gravel and cobbles of foreign material; abrupt, wavy
Bf	13–17	7.5YR 5/8; sandy loam; weak, fine, granular; very friable; 10% coarse fragments, subangular and subrounded gravel and cobbles of foreign material; clear, wavy
Bfgj	17–22	7.5YR 5/6; sandy loam; common fine, distinct 10YR 5.5/4 mottles; weak to moderate, medium and coarse, granular; very friable; 10% coarse fragments, subangular and subrounded, gravel and cobbles of foreign material; clear, wavy

Horizon	*Depth (cm)*	*Description*
BC	22–36	10YR 5/6; loam; common fine, faint, 7.5YR 5/6 mottling; weak, fine, subangular blocky; friable; 10% coarse fragments, subangular and subrounded, gravel and cobbles of foreign material; gradual, wavy
BCxtj	36–70	10YR 5/4; gritty sandy loam; common fine to medium, prominent 7.5YR 5/7 streaks; moderate, fine and medium, subangular blocky; very firm in situ, friable to firm on excavation, brittle; few thin to very thin, clay films on ped and coarse fragment surfaces; 20-25% coarse fragments, mostly subangular and subrounded gravel, with some cobbles, of foreign material; clear, irregular
C	70+	10YR 4.5/4; gritty loam; common fine to medium, distinct 10YR 4/6 mottles; strong, medium, angular blocky; firm to very firm in situ, firm on excavation; common, thin clay films around coarse fragments and in pores and on ped surfaces; 40% coarse fragments, subangular and subrounded cobbles and gravel with some stones of foreign material

Note: 1. Foreign material refers to fragments of granitic, metamorphic (gneiss, schist, slate, and argillite), and some volcanic rocks.
2. Subangular stones of foreign material were scattered throughout the profile with the majority in the subsurface horizons.

Soil unit RS2

		Mechanical analysis Sand fraction %									Bulk	% Pore space			% Moisture				Hy-
Hori-	Depth	2–1	1–0.5	0.5–0.25	0.25–0.1	0.1–0.05	Total	%	%	Text.	density	Macro	Micro	Total	10 cm	50 cm	33	1500	draulic conduc-
zon	cm	mm	mm	mm	mm	mm	sand	Silt	Clay	class	g/cm^3				H_2O	H_2O	kPa	kPa	tivity cm/hr
Ae	0–10	8.6	11.2	13.3	15.8	10.6	59.4	36.5	4.1	SL									
Bhf	10–13	9.4	12.7	13.8	12.4	7.5	55.8	26.0	18.2	SL									
Bf & Bfgj	13–22	14.0	12.3	14.0	14.6	9.2	64.2	28.3	7.5	SL									
BC	22–36	9.0	8.8	11.2	13.1	8.5	50.6	37.7	11.7	L									
BCxtj	36–70	9.4	10.9	12.8	13.3	7.1	53.5	35.5	11.1	SL									
C	70	9.3	10.0	12.0	13.3	6.3	50.9	32.0	17.1	L									

	Depth	pH		Org. C	Exchangeable cations				% Free Fe and Al Dithionate		Oxalate		Pyrophosphate		Available P
Horizon	cm	H_2O	$CaCl_2$	%	Ca	Mg	Al	K	Fe	Al	Fe	Al	Fe	Al	(ppm)
Ae	0–10	4.3	3.9	0.5	—	—	—	—	0.1	0.1	0.0	0.1	0.0	0.0	1.6
Bhf	10–13	5.2	4.8	5.1	—	—	—	—	3.1	1.6	2.3	2.1	1.1	1.3	10.0
Bf & Bfgj	13–22	5.4	—	1.8	—	—	—	—	1.5	1.2	0.9	2.7	0.1	0.5	1.3
BC	22–36	5.4	5.2	0.8	0.2	0.0	0.1	0.1	0.8	0.5	0.4	0.9	0.1	0.3	2.0
BCxtj	36–70	5.4	4.9	0.2	0.3	0.1	0.2	0.1	0.5	0.1	0.2	0.2	0.0	0.1	21.1
C	70	5.4	4.7	0.1	0.7	0.4	0.5	0.2	0.7	0.1	0.2	0.2	0.0	0.1	20.9

Note: This profile is slightly low in clay content for a typical Rogersville soil.

Rogersville Association

Soil unit:	RS4
Location:	lat. 46°44′50″ long. 65°24′29″
Parent material:	fine loamy lodgment till with granitic, metamorphic, and some volcanic coarse fragments over a fine loamy lodgment till dominated by sandstone coarse fragments
Slope:	0.5%
Aspect:	southeast
Elevation:	95 m AMSL
Drainage:	imperfect
Classification:	Gleyed Podzolic Gray Luvisol

Horizon	*Depth (cm)*	*Description*
Ap	0–17	10YR 4/3; sandy loam; moderate, fine subangular blocky; very friable; 10-15% coarse fragments, mostly gravels, of dark volcanic rock, slate, green siltstone, gneiss, schist, and granite (practically no sandstone); abrupt, smooth
Bf	17–23	9YR 5/7; sandy loam; moderate, fine subangular blocky; friable; 15-20% coarse fragments, mostly gravel, similar in rock type to that of the Ap horizon; clear, smooth
Bfgj	23–35	10YR 5/6; gravelly sandy loam; common medium, faint 7.5YR 5/7 and few fine and medium, prominent 7.5YR 6/2 mottles; weak, fine and medium, subangular blocky; friable; 20-25% coarse fragments, mostly gravel, similar in rock type to that of the Ap horizon; abrupt, smooth
Bc	35–45	10YR 5/5; gravelly sandy loam to gravelly sandy clay loam; common fine, faint 10YR 5/6 mottles; moderate, fine and medium, subangular blocky; firm to very firm, hard, compact; 30% coarse fragments, mostly gravel and a few cobbles, similar in rock type to that of the Ap horizon; abrupt, smooth
Btxjgj	45–80	9YR 4/3.5; sandy clay loam; common coarse, distinct 10YR 5.5/4 and few fine, prominent 5YR 5/8 mottles; massive in situ breaking into moderate, medium and coarse, subangular blocky when excavated; very firm, very hard, compact, slightly brittle; common thin clay films along the ped surfaces; 25% coarse fragments, mostly gravel but some cobbles and a few stones, similar in rock type to that of the Ap horizon; abrupt, smooth
IICxj	80+	10YR 4/3; sandy loam; massive in situ breaking into moderate to strong, medium platy when excavated; very firm and hard, compact, slightly brittle; 25% coarse fragments, mostly cobbles, stones, and sandstone

Note: 1. The whole profile is strongly acid.
2. No analytical information available.

Rogersville Association

Soil unit:	RS7
Location:	lat. 46°47′45″ long. 65°21′52″
Parent material:	about 80 cm of brown lodgment till with mainly granitic and volcanic rock coarse fragments over red lodgment till with Pennsylvanian sandstones, red shale, and siltstone coarse fragments
Slope:	0-1%
Aspect:	west
Elevation:	76 m AMSL
Drainage:	poor
Classification:	Fragic Luvic Gleysol

Horizon	*Depth (cm)*	*Description*
Apg	0–19	10YR 4/3 with common coarse, prominent 10YR 5/6 mottles; gravelly loam; moderate, medium subangular blocky; friable; about 15% gravel, mostly subangular granitic and dark volcanic; relatively stone free; abrupt, smooth
Aegj	19–22	10YR 6/2.5 with common medium, distinct 10YR 5/3 mottles; loam; weak, fine, subangular blocky; friable; 10% fine gravel, mostly same kinds as Apg; abrupt, broken
Bg	22–29	10YR 5/3 with many fine to very fine, prominent 10YR 5/6 mottles; loam; moderate, medium and fine subangular blocky; friable, 10% fine gravel, mostly quartz, feldspars, and some volcanic rock fragments; smooth, abrupt

Horizon	*Depth (cm)*	*Description*			
Bgx & Aexjg	29–61	Bgx is 10YR 4/4 with many medium, distinct 10YR 5/6 mottles; gravelly loam; moderate to strong, medium, subangular blocky; firm, brittle, and hard; 15-20% coarse fragments (most fine gravels are quartz and feldspars, but most coarse gravels are granitic rock fragments and angular volcanic rock fragments); Aexjg is 2.5Y 6/2 with common fine and medium, prominent 10YR 5/6 mottles; sandy loam; moderate, fine, subangular blocky; friable and slightly brittle; forming streaks within the Bgx horizon, streaks have a width of 1.5 cm to less than 0.5 cm; 10% fine gravel (quartz and feldspars); boundary between Bgx and Aexjg is abrupt, however, boundary between Bgx and the lower horizon (Btxg) is wavy, clear			situ becomes moderate, coarse, subangular blocky after excavation; firm, hard, and brittle; common thin clay films in voids; 15-20% gravel, mostly quartz, feldspars, a few sandstones, siltstone, and volcanic rock fragments; common, fine black manganese specks; smooth, clear
			Cgj	77–82	8.5YR 5/4 with many fine, distinct 8.5YR 5/6 and common coarse, distinct 10YR 5/3 mottles; loam; massive in situ, becomes weak, coarse, subangular blocky after excavation; firm but not brittle; 10-15% gravel, same as Btxg in kinds, but slight increase in siltstone and sandstone; few thin clay films in voids; common fine to medium manganese specks; wavy, abrupt
			IIC	82+	5YR 4/3; loam; massive; firm, compact, plastic, and very sticky; few thin clay film in voids; 15% stone and cobble, mostly Pennsylvanian sandstone, red shale and siltstone
Btxg	61–77	2.5Y 5/4 with many coarse, prominent 8.5YR 5/6 mottles plus common fine distinct 2.5Y 6/2 mottles; gravelly loam; massive in			

Soil unit RS7

Horizon	Depth cm	Mechanical analysis Sand fraction % 2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	% Pore space Macro	Micro	Total	% Moisture 10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	Hydraulic conductivity cm/hr
Apg	0–19	7.8	8.5	11.3	11.6	7.3	46.5	41.6	11.9	L									
Aegj	19–22	5.8	8.6	10.8	12.9	7.7	45.6	42.7	11.6	L									
Bg	22–29	6.9	9.4	10.9	13.2	7.5	47.8	39.0	13.2	L									
Bgx	29–61	7.3	9.0	10.5	11.7	6.4	44.8	37.2	18.0	L									
Aexjg	29–61	10.1	11.1	12.2	13.6	8.0	55.0	34.1	10.9	SL									
Btxg	61–77	6.7	8.4	11.0	12.6	6.4	45.1	35.9	19.0	L									
Cgj	77–82	4.7	6.8	11.5	13.8	6.5	43.2	35.7	21.1	L									
IIC	81	1.0	2.8	11.6	14.8	6.1	36.2	36.7	27.0	L									

Horizon	Depth cm	pH H_2O	pH $CaCl_2$	Org. C %	Exchangeable cations Ca	Mg	Al	K	% Free Fe and Al Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available P (ppm)
Apg	0–19	5.2	4.6	1.8	0.6	0.3	0.3	0.1	0.7	0.2	0.4	0.2	0.2	0.1	5.1
Aegj	19–22	5.2	4.4	0.8	0.8	0.3	0.7	0.1	0.6	0.2	0.3	0.1	0.2	0.1	8.7
Bg	22–29	4.9	4.1	0.6	0.6	0.2	0.6	—	0.8	0.2	0.3	0.2	0.3	0.2	12.3
Bgx	29–61	5.2	4.4	0.3	1.7	1.7	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	4.3
Aexjg	29–61	4.8	4.2	0.3	0.6	0.4	0.2	0.4	1.4	0.1	0.4	0.1	0.0	0.1	1.0
Btxg	61–77	5.4	4.8	0.2	3.0	2.4	0.0	0.2	1.4	0.2	0.6	0.2	0.1	0.1	9.2
Cgj	77–82	5.8	5.2	0.1	4.6	2.8	0.0	0.2	2.0	0.1	0.5	0.1	0.2	0.2	28.3
IIC	82	6.0	5.4	0.1	4.8	3.5	0.0	0.2	2.1	0.1	0.4	0.1	0.1	0.1	99.7

Stony Brook Association

Soil unit: SB2
Location: lat. 46°30′52″ long. 65°09′40″
Parent material: fine loamy lodgment till
Slope: 6%
Aspect: south
Elevation: 18 m AMSL
Drainage: well drained
Classification: Podzolic Gray Luvisol

Horizon	*Depth (cm)*	*Description*
LFH	3–0	consists mainly of moderately decomposed feather moss and needles
Ahe	0–4	10YR 5/2; loam; weak to moderate; fine to medium, subangular blocky; friable; 5% rounded and subrounded sandstone gravels; abrupt, wavy
Ae1	4–14	10YR 7/2; loam; weak, fine, platy and weak, fine subangular blocky; friable; 5% rounded and subrounded sandstone gravel; abrupt, wavy
Bf	14–34	6YR 5/5; clay loam; moderate, fine, granular; very friable; 5% rounded and subrounded sandstone gravels; abrupt, wavy
Ae2	34–40	7.5YR 6/4 (ex ped) and 5YR 4/3 (in ped); clay loam; moderate, medium to coarse, subangular blocky; firm; 10% rounded and subrounded sandstone gravel and thin flat sandstone cobbles; clear, irregular
Bt	40–90	4YR 3.5/3; clay loam; moderate to strong, coarse, subangular blocky; firm; 15% rounded and subrounded sandstone gravel and flat thin sandstone cobbles and stones; gradual smooth
C	90+	4YR 3.5/3; clay loam; weak to moderate, coarse, subangular blocky; firm; 20% rounded and subrounded sandstone gravel and thin flat sandstone cobbles and stones

Note: 1. The surface horizons of soils of the Stony Brook association are typically redder (5YR hue) than in this profile.

Soil unit SB2

Horizon	Depth cm	Mechanical analysis Sand fraction % 2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	% Pore space Macro*	Micro*	Total	% Moisture 10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	Hydraulic conductivity cm/hr
Ahe	0–4	0.5	5.2	12.9	17.9	7.2	43.8	39.0	17.2	L	1.1	25.4	32.5	57.9	35.4	29.4		5.5	
Ae1	4–14	0.3	3.4	11.2	21.1	9.4	45.3	41.5	13.2	L									
Bf	14–34	0.4	4.1	10.8	17.0	7.1	39.3	32.0	28.7	CL									
Ae2	34–40	0.4	3.1	8.8	15.0	7.3	34.6	37.1	28.3	CL									
Bt	40–90	0.2	2.7	8.0	14.4	6.7	32.0	35.1	32.9	CL									
C	90	0.2	2.8	7.6	14.2	7.0	31.8	36.1	32.1	CL	1.76	12.2	26.2	38.4	16.4	15.0		12.1	0.1

Horizon	Depth cm	pH H_2O	pH $CaCl_2$	Org. C %	Exchangeable cations Ca	Mg	Al	K	% Free Fe and Al: Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available P (ppm)
Ahe	0–4	3.7	3.4	2.8	1.7	1.1	3.0	0.2	0.5	0.2	0.1	0.1	0.2	0.1	16.7
Ae1	4–14	3.8	3.5	0.5	0.7	0.3	3.2	0.1	0.4	0.1	0.1	0.1	0.1	0.1	8.8
Bf	14–34	3.9	3.7	1.6	0.3	0.1	3.3	0.1	1.9	0.4	0.7	0.4	0.9	0.5	36.5
Ae2	34–40	4.3	3.7	0.3	0.5	0.2	3.7	0.1	1.4	0.2	0.3	0.2	0.4	0.5	5.3
Bt	40–90	4.2	3.6	0.1	3.2	2.0	2.5	0.2	1.8	0.1	0.3	0.1	0.2		39.6
C	90	5.7	5.1	0.1	7.3	2.1	0.0	0.1	1.8	0.1	0.1	0.1	0.2	0.3	203.5

*At a tension of 50 cm of H_2O, the micropores retain their water while the macropores do not.

Stony Brook Association

Soil unit: SB7
Location: lat. 46°06′54″ long. 65°19′04″
Parent material: fine loamy lodgment till
Slope: 0%
Aspect: N/A
Elevation: 80 m AMSL
Drainage: poor
Classification: Orthic Luvic Gleysol

Horizon	*Depth (cm)*	*Description*
LFH	10–0	consists of moderately decomposed needles and sphagnum moss
Aeg	0–15	5Y 7/2; many coarse, prominent 10YR 5/6 mottles; silt loam; very weak, medium, subangular blocky; friable; abrupt, wavy
Btg	15–52	5YR 4/3; many medium, prominent 5YR 5/8 mottles and many coarse, prominent 5Y 7/2 mottles; clay loam; weak to moderate, coarse subangular blocky; thin clay films along ped surface; firm; 6% sandstone coarse fragments, rounded and subrounded gravel, cobbles, and thin flat stones; clear, smooth
BCg	52–68	5YR 4/3; common medium, prominent, 5YR 5/8 mottles; gravelly clay loam; very weak, coarse subangular blocky; very firm; 30% sandstone coarse fragments, rounded and subrounded cobbles, gravel, and thin flat stones; gradual, smooth
Cg	68+	5YR 4/3; few medium, prominent 5YR 5/8 mottles; gravelly clay loam; massive to very weak, coarse, platy; very firm; 20% sandstone coarse fragments, rounded to subrounded gravel, cobbles, and thin flat stones

Soil unit SB7

Horizon	Depth cm	Mechanical analysis Sand fraction % 2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	% Pore space Micro	Total	% Moisture 10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	Hydraulic conductivity cm/hr
Aeg	0–15	2	14	21	21	9	67	24	9	SL								
Btg	15–52	1	8	10	13	8	40	34	26	L								
Cg	68	2	7	9	14	9	41	37	22	L								

Horizon	Depth cm	pH H_2O	pH $CaCl_2$	Org. C %	Exchangeable cations Ca	Mg	Al	K	% Free Fe and Al: Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available P (ppm)
Aeg	0–15	4.2	3.5	0.8	0.1	0.1	3.6	0.0	0.1	0.1	0.0	0.1	0.0	0.1	
Btg	15–52	4.8	3.8	0.2	0.6	0.7	4.0	0.1	1.4	0.1	0.5	0.2	0.1	0.1	
Cg	68+	5.1	4.0	0.1	1.5	1.8	3.0	0.1	2.0	0.1	0.6	0.1	0.1	0.1	

Sunbury Association

Soil unit: S2
Location: lat. 46°43'36" long. 65°15'44"
Parent material: coarse loamy ablation till
Slope: 5%
Aspect: southwest
Elevation: 60 m AMSL
Drainage: well drained
Classification: Orthic Humo-Ferric Podzol

Horizon	*Depth (cm)*	*Description*
LFH	1.5–0	5YR 2/1; mixture of conifer needles and deciduous leaves and mineralized organic matter; evidence of fire, charcoal bits
Ae	0–4	7.5YR 6.5/2; sandy loam; weak, medium, granular; loose; many angular and subrounded gravel fragments of sandstone; abrupt, wavy (there are pockets of Ae down to 10 cm)
Bf	4–20	7.5YR 5/6; gravelly sandy loam; weak, medium granular breaking down to fine granular; very friable to loose; many angular and subrounded gravel fragments of sandstone; gradual, wavy
BC	20–33	7.5YR 5/8; sandy loam; weak, coarse to medium, granular; very friable to loose; some angular and subrounded gravel fragments of sandstone; diffuse wavy
CB	33–46	10YR 5/4; loamy sand; weak pseudoplaty breaking down to large and medium granular; very friable; some subangular fragments of sandstone; diffuse, wavy
C	46+	10YR 5/4; gravelly loamy sand; weak, coarse granular breaking down to medium granular; loose; many subrounded and angular fragments of sandstone

Soil unit S2

Horizon	Depth cm	Mechanical analysis Sand fraction % 2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	% Pore space Macro	Micro	Total	% Moisture 10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	Hydraulic conductivity cm/hr
Ae	0–4	1.5	3.7	19.4	30.9	13.3	68.8	27.4	3.8	SL	1.1	29.5	29.9	59.5	45.8	28.5		9.2	89.5
Bf	4–20	3.7	5.3	19.5	28.3	12.1	68.9	21.6	9.5	SL									
BC	20–33	1.7	3.1	17.0	35.5	16.8	74.1	20.7	5.3	SL	1.1	26.0	31.3	57.3	45.8	29.5		4.6	34.6
CB	33–46	2.1	3.8	18.8	36.0	15.3	76.0	18.2	5.8	LS	1.4	18.2	25.4	43.6	27.4	17.9		2.6	11.8
C	46	3.0	5.3	25.4	30.4	13.5	77.5	18.3	4.2	LS	1.5	18.[illegible]	21.7	40.2	23.0	14.3		2.0	12.7

Horizon	Depth cm	pH H_2O	pH $CaCl_2$	Org. C %	Exchangeable cations Ca	Mg	Al	K	% Free Fe and Al: Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available P (ppm)
Ae	0–4	3.8	3.2	0.6	0.4	0.1	1.9	0.3	0.2	0.0	0.0	0.1	0.1	0.1	3.6
Bf	4–20	4.8	4.5	1.7	0.7	0.1	0.2	0.2	2.1	1.0	1.1	2.0	0.3	0.3	6.6
BC	20–33	5.1	4.7	0.6	0.5	0.0	0.1	0.1	0.9	0.5	0.4	1.0	0.0	0.1	4.2
CB	33–46	4.7	4.3	0.2	0.3	0.0	0.2	0.1	1.1	0.5	0.1	0.0	0.0	0.0	5.7
C	46	4.6	4.1	0.1	0.4	0.1	0.3	0.1	0.4	0.1	0.1	0.1	0.0	0.1	6.2

*At a tension of 50 cm of H_2O, the micropores retain their water while the macropores do not.

Sunbury Association

Soil unit:	S2
Location:	lat. 46°38′33″ long. 65°43′49″
Parent material:	coarse loamy ablation till
Slope:	2%
Aspect:	northwest
Elevation:	57 m AMSL
Drainage:	well drained
Classification:	Orthic Humo-Ferric Podzol

Horizon	*Depth (cm)*	*Description*
LFH	8–0	pH 3.8
Ae	0–4	7.5YR 7/2; medium sandy loam; weak, fine subangular blocky; very friable; irregular, abrupt; pH 3.8
Bf	4–38	7.5YR 5/8; medium sandy loam; strong, fine and medium, granular; very friable; 5-10% gravel; wavy, abrupt; pH 4.6
BC	38–56	2.5Y 5/4 with common fine, distinct 10YR 5/6 mottling; medium sandy loam; moderate fine subangular blocky; friable; 15-20% cobbles and gravel; smooth, clear; pH 4.6
C	56+	2.5Y 5/4; medium sandy loam; weak, fine platy; friable; 15-20% cobbles and gravel; pH 4.8

Note: 1. The cobbles are thin flat gray sandstone.
2. No analytical information available.

Sunbury Association

Soil unit:	S4
Location:	lat. 46°53′47″ long. 65°40′05″
Parent material:	coarse loamy ablation till
Slope:	1.5%
Aspect:	southeast
Elevation:	45 m AMSL
Drainage:	imperfect
Classification:	Gleyed Humo-Ferric Podzol

Horizon	*Depth (cm)*	*Description*
LFH	2–0	5YR 2.5/1; consists mostly of semidecomposed needles, bark, roots, branches, and ground vegetation; pH 4.5
Aegj	0–9	10YR 6.5/2; sandy loam; common, medium, distinct 10YR 6/3.5 mottling; weak, fine and medium, subangular blocky; very friable; 15-20% coarse fragments, angular and subangular cobbles, with some gravel and a few stones, of sandstone; abrupt, wavy; pH 4.3
Bf1	9–27	8YR 5.5/8; sandy loam; weak, fine, granular; very friable; 30-35% coarse fragments, angular and subangular cobbles, with some gravel and a few stones, of sandstone; gradual, wavy; pH 4.8
Bf2	27–46	7.5YR 5/8; sandy loam; very weak, fine, granular; very friable; 30-35% coarse fragments, angular and subangular cobbles, with some gravel and a few stones, of sandstone; clear, wavy; pH 5.2
BCgj	46–67	10YR 4/5; sandy loam; common fine, faint 10YR 5/6 and common fine prominent 10YR 7/3 mottles; weak, fine, granular with some weak, fine subangular blocky; very friable; 25% coarse fragments, angular and subangular gravel and cobbles of sandstone; gradual, wavy; pH 5.1
C	67+	10YR 5/4; sandy loam; weak, fine, subangular blocky; friable; 40-50% coarse fragments, mostly angular and subangular cobbles and flat stones with some subangular and subrounded gravel, of sandstone; pH 4.9 (In the upper C horizon there is a streak of 2.5Y 6.5/2 surrounded by a thin layer of 10YR 5/6. The streak is fine sandy loam; friable to firm; 2-5 cm thick; discontinuous; pH 4.9.)

Soil unit S4

Horizon	Depth cm	Mechanical analysis Sand fraction % 2–1 mm	1–0.5 mm	0.5–0.25 mm	0.25–0.1 mm	0.1–0.05 mm	Total sand	% Silt	% Clay	Text. class	Bulk density g/cm³	% Pore space Macro	Micro	Total	% Moisture 10 cm H_2O	50 cm H_2O	33 kPa	1500 kPa	Hydraulic conductivity cm/hr
Aegj	0–9	0.3	2.6	37.9	28.4	5.5	74.7	18.8	6.5	SL									
Bf1	9–27	1.1	3.2	32.6	24.8	4.9	66.6	19.7	13.7	SL									
Bf2	27–46	2.9	6.3	26.2	21.7	6.8	63.9	21.2	14.9	SL									
BCgj	46–67	1.1	4.0	31.5	32.2	7.4	76.3	15.4	8.3	SL									
C	67+	2.0	4.9	27.6	26.8	7.0	68.2	22.7	9.1	SL									

Horizon	Depth cm	pH H_2O	pH $CaCl_2$	Org. C %	Exchangeable cations Ca	Mg	Al	K	% Free Fe and Al: Dithionate Fe	Dithionate Al	Oxalate Fe	Oxalate Al	Pyrophosphate Fe	Pyrophosphate Al	Available P (ppm)
Aegj	0–9	4.0	3.4	0.6	0.3	0.1	2.0	0.1	0.2	0.1	0.1	0.1	0.0	0.0	2.4
Bf1	9–27	4.9	4.6	1.6	0.2	0.0	0.7	0.1	1.7	0.8	0.9	0.9	0.4	0.5	3.9
Bf2	27–46	5.2	5.0	1.8	0.2	0.1	0.1	0.2	3.5	1.4	2.4	2.4	0.3	0.5	16.4
BCgj	46–67	5.4	5.0	0.3	0.3	0.0	0.1	0.1	0.1	0.3	0.2	0.4	0.1	0.2	4.4
C	67+	5.1	4.5	0.2	0.3	0.0	0.5	0.1	0.6	0.2	0.2	0.2	0.1	0.1	10.1

Tracadie Association

Soil unit: TD3
Location: lat. 46°33′02″ long. 64°58′41″
Parent material: calcareous marine clay
Slope: 5%
Aspect: north
Elevation: 35 m AMSL
Drainage: moderately well drained
Classification: Gleyed Brunisolic Gray Luvisol

Horizon	*Depth (cm)*	*Description*
Ah	0–5	5YR 3/2; silty clay loam; strong, fine granular; friable; smooth, abrupt; pH 4.8
Bm1	5–20	2.5YR 3/5; silty clay loam; strong, medium granular; very friable; smooth, abrupt; pH 4.6
Bm2	20–38	2.5YR 4/4; silty clay loam; strong, fine subangular blocky; friable; smooth, abrupt; pH 4.6
Btgj	38–55	2.5YR 4/4 with few fine, distinct, 5YR 5/6 mottles; silty clay; strong, medium blocky; very firm; common thin clay films; smooth, clear; pH 5.0
Bt	55–80	2.5YR 3/4; silty clay; strong, coarse blocky; very firm; few thin clay films; pH 5.4
CK	112–120	10R 4/4; silty clay; strong, coarse platy; very firm; strongly calcareous

Note: 1. No analytical information available.

Upper Caraquet Association

Soil unit: UC7
Location: lat. 46°39′51″ long. 64°47′41″
Parent material: marine sand over marine clay
Slope: 1%
Aspect: north
Elevation: 9 m AMSL
Drainage: poor
Classification: Orthic Humic Gleysol

Horizon	*Depth (cm)*	*Description*
H	5–0	range 5-7 cm; pH 4.3
Ah	0–14	5YR 2/1; sandy loam; moderate, coarse granular; very friable; range 10-18 cm; wavy, abrupt; pH 4.3
Aeg	14–24	2.5Y 5/2 with many, coarse, prominent 10YR 5/8 mottles; sandy loam; friable; range 6-12 cm; wavy, abrupt; pH 4.6
Bg	24–50	2.5Y 4/2 with many, coarse, prominent 5YR 4/6 and common medium, distinct 2.5Y 6/4 mottles; loamy sand; friable; range 20-25 cm; smooth, abrupt; pH 4.6
IICg	50+	5YR 4/3 with many coarse, prominent 5GY 6/1 and many medium, prominent 5YR 5/6 mottles; silty clay loam; very firm; pH 4.6

Note: 1. No analytical information available.